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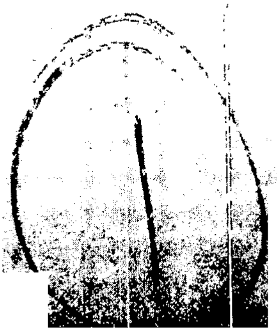
Applied Linguistics as an Emerging Discipline



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VOLUME 20 ● *2000*

APPLIED LINGUISTICS
AS AN EMERGING DISCIPLINE

Editor-in-Chief
William Grabe

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This twentieth volume of the *Annual Review of Applied Linguistics*, like the preceding volumes which were published beginning in 1981, is respectfully dedicated to the many professional Applied Linguists who were involved in helping to launch and sustain this publication; to those who have helped to formulate the framework for this and the previous volumes; to those who have generally contributed to the series; and to all Applied Linguists and their students who, hopefully, will reap some benefit from its existence.

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FOREWORD

William Grabe

OVERVIEW OF VOLUME 20

The twentieth volume of ARAL, as an anniversary edition, explores the evolving discipline of applied linguistics from a variety of perspectives. Rather than ask fifteen authors to provide general positions on the status of applied linguistics, the invitation to contribute to ARAL 20 asked authors to consider the status of applied linguistics from the perspective of their own fields of study and major topical issues. Contributors received a small set of questions asking them to situate their own fields of study within a framework informed by applied linguistics. For example, contributors were asked 1) how their own research sub-fields were located within applied linguistics, 2) how applied linguistics will make the strongest contributions in the coming decade—from the perspective of their own sub-fields, and 3) what obstacles confront their sub-fields and applied linguistics more generally. Some of the authors have addressed these issues explicitly while others have recognized more implicitly the frame of reference that is provided by applied linguistics.

In a number of cases, the natural tensions generated by a relatively ill-defined and interdisciplinary domain such as applied linguistics have led to a questioning of the role that applied linguistics plays in certain fields (e.g., literacy, second language acquisition); other authors have noted a complementary tension—the umbrella of applied linguistics may be fragmenting to a number of more autonomous sub-fields (e.g., second language acquisition, language testing). The tensions are even apparent in discussions of language teacher education with its shift away from the pervasive influence of linguistic foundations as a given orientation and a movement toward general teacher education and reflective practices—a move from methods to methodology and from language knowledge to teaching knowledge.

I will refrain, at this point, from offering an extended perspective on applied linguistics since such a perspective is offered in the first chapter of the volume. I will simply point out that a range of views on the status and scope of applied linguistics as a discipline appears in many of the chapters to follow. In particular, Widdowson and Tucker provide extended explorations of this very topic. Widdowson draws on Hymes' theory of communicative competence to make a persuasive argument that applied linguists are uniquely positioned to mediate issues of language knowledge and use in relation to their applications in real-world contexts, particularly with respect to language teaching and teacher training. Tucker notes that there are many conflicts and tensions with any disciplinary interpretation of applied linguistics, and there are dangers that the conceptual center is under centrifugal pressure with a real potential to separate into many smaller disconnected domains. Nevertheless, he remains confident that, over the next decade, applied linguistics will strengthen, supported by the central role of language for learning in all fields, the interdisciplinary advantages inherent to applied linguistics, and the real applications and realistic solutions that it can offer. As Tucker notes, "at some point, policy makers and prospective funders will come to realize the centrality of language issues for educational and national development."

ARAL 20 presents perspectives from a number of research fields: Chapters cover language teaching and teacher training, literacy, language policy, language assessment, second language acquisition, and second language processing. In some respects, then, the volume is like other past overview volumes of ARAL (see Volumes 10, 15, 19). However, it differs in one major respect: The authors of each chapter consider how their fields are situated within applied linguistics, and whether or not such positioning is problematic.

On reviewing the many contributions to this volume, it is clear that no one person will have all the answers to the many questions raised about the future role and status of applied linguistics, and, if nothing else, this volume is a testament to the many interpretations available as well as the complexities involved. One goal of the volume, given this multivocal complexity, is to allow readers to find positions and views, both explicit and implicit, that will accord with their own sense of applied linguistics as a discipline. In this respect, the volume is intended to generate discussion that advances our understanding of applied linguistics, expands the range of research that can be carried out under its umbrella, and promotes the potential for interdisciplinary connections.

PROCEDURAL NOTES

Since the *ARAL* series is, in part, meant to be a research reference tool, the following procedural notes are intended as a guide. All bibliographic entries follow the basic format of the Linguistic Society of America (LSA), although a unique citation form has emerged for the *ARAL* series. With respect to internal citation, the two types of bibliographies—*annotated* and *unannotated*—should be viewed as integrated, so that in instances where there is more than one entry for a given author for a particular year (e.g., 1990a; 1990b), it is possible that either of the entries may occur in either of the bibliographies; that is, 1990a may be in the annotated bibliography while 1990b may be in the unannotated bibliography, or vice versa. No items are duplicated between the two separate bibliographic lists; that is, the item identified as 1990a will *not* occur in both the annotated and the unannotated bibliography. Both types of bibliography—annotated and unannotated—are arranged in strict alphabetical order by the last name of the first author. Individual entries will precede works co-authored or co-edited by that same author (or set of authors). Repeated authors are indicated by the use of a solid line [______] of the same length as the name (or names) it replaces. Sources that include cited articles may not necessarily be represented in either bibliographic list if they are not in general germane to the particular area under discussion; in general, belletristic works cited as examples (or for more literary purposes) are not included in either bibliographic list, though they are identified in detail in the article in which they occur. In all texts contributed to the *ARAL* series, an editorial effort has been made to conform generally to the usages and spellings common in the United States. Where possible, English translations of all non-English sources are provided. All contributed papers have been composed specifically for publication in the *ARAL* series and have not (unless otherwise specifically noted) appeared elsewhere previously, although their contents may have been used in whole or in part in oral presentations by the author(s).

The Editorial Directors do not assume responsibility for the positions taken by contributors. Contributions often involve issues of policy as well as more clearly language-related issues. The Editorial Directors wish to be held blameless for opinions and errors of fact expressed by any contributor. The Editor apologizes in advance for any editorial errors that may have crept into the texts and accepts full responsibility for any such editorial errors, but not for substantive errors which are the sole responsibility of each contributor. Bibliographies are prepared and submitted by the contributors; the Editor makes every effort to assure the accuracy of each bibliographic entry that appears in every volume of *ARAL*, but in the case of materials not readily available through libraries or other bibliographic sources in the United States, the Editor is dependent upon the accuracy of material submitted by the contributors. In some few instances, inclusive pages for cited articles, which originally appeared in anthologies or collections, are not given; such omissions occur only when the original source is not available to the Editor and/or when the contributor has not supplied the appropriate pagination. In materials listed in well-known storage and retrieval networks like ERIC and the British Council's ELT Documents, reference numbers are also provided; when titles available only through electronic data bases are cited, every effort is made to provide an accession number (e.g., ERIC files).

This twentieth volume of *ARAL* continues the practice, first established in the third volume, of including a running index of authors cited and topics covered in previous issues of *ARAL*. However, this list became so large that it has become necessary to eliminate the listings from the earliest volumes. Thus, Volume 6 included a cumulative bibliography of Volumes 1 through 5; beginning with Volume 7 as each new year is added, the oldest year's citations have been dropped from the list. In this issue (Volume 20), the cumulative citation listing will include citations from Volumes 15 through 19. Beginning with Volume 5, a Contributor Index was added to the series; in each issue, previous contributors to *ARAL* are indexed in a single alphabetical list. With the *ARAL* series now in its second decade, the Contributor Index lists articles appearing in the previous ten years (Volume 10 through Volume 19). There is also a ten-year Subject Index.

The indices are presented separately—an *Author* Index, a *Subject* Index, and a *Contributor* Index—at the end of each volume. The Author Index cites every item that has appeared in the bibliographies accompanying each article. Each author citation is accompanied by one or more Roman numerals and Arabic numbers (e.g., Sharp, D. X/120). The Roman numeral represents the number of the *ARAL* volume in which the author is cited, and the Arabic number represents the page(s) in that volume in which the citation occurs. Thus, X/120 means that Sharp is cited in *ARAL X* (the volume published in 1990). Multiple sets of numbers (e.g., Bazerman, C. X/156; XI/72, XI/82, aXI/109) mean that the author is cited in more than one place. The prefixed lower case 'a' (e.g., in aXI/109) indicates that the citation occurs in an annotated bibliography. To the extent that *ARAL* may be said to represent the field accurately, the Author Index may be used as a citation index and be a supporting criterion for merit and promotion evaluation in U.S. institutions.

The Subject Index provides the traditional alphabetical list of topics covered, giving inclusive pages by volume for the point at which the discussion occurs (e.g., X/274–276); this entry indicates that the subject is covered on pp. 274–276 in Volume X. Multiple number sets (e.g., Variationist sociolinguistics: V/48-53; XI/3–16) indicate that the subject (*variationist sociolinguistics*, in this case) is discussed in two places in the series, once in Volume V on pp. 48–53, and again in Volume XI on pp. 3–16.

The Contributor Index provides a traditional alphabetical listing of all contributors to the *ARAL* series for the previous ten years. The citation includes the complete title of the contribution as well as the name of the contributor. Each entry, as in the other indices, carries two designations (e.g., X/163); the first number designates the volume in which the contribution occurs (in this case Volume X), and the second number indicates the page in that volume on which the contribution begins.

ACKNOWLEDGEMENTS

This twentieth volume is my last as Editor of *ARAL*. Beginning with Volume 21, Mary McGroarty, Northern Arizona University, will assume the Editorship. During the ten years that I have been Editor, I have been very fortunate to have been able to draw upon the experience and insights of the Editorial Directors of *ARAL*: Charles Ferguson, Robert Kaplan, Mary McGroarty, Merrill Swain, Dick Tucker, Henry Widdowson, and Janice Yalden. Their guidance and support have allowed *ARAL* to grow significantly as an applied linguistics publication. Over the last ten years, I have also been aided by the suggestions and comments of the Advisory Board, and I thank them for their willingness to support and promote *ARAL* and my work as Editor. They have served as a very important resource for planning and for the nomination of *ARAL* contributors.

Closer to home, I would like to thank my Editorial Assistant, Beth Yule, for all the extra time and effort that is required to keep *ARAL* running smoothly. It would not be possible for me to produce *ARAL* without her, and for ten years she has managed to keep her sense of humor throughout the entire process. I would like to thank Jeffrey Popko, Latricia Trites, and Harley Stoller for proofreading the manuscript and pointing out many editorial matters that I had overlooked. I would also like to thank Julie McCormick for computer consultation, for editorial assistance, and for putting the final copy through a page layout program. Finally, I would like to acknowledge the support and assistance of the Department of English and the College of Arts and Sciences at Northern Arizona University. For ten years, they have provided the Editor with the basic facilities and have absorbed some of the incidental costs associated with the production of this series.

William Grabe
Flagstaff, Arizona
December 1999

APPLIED LINGUISTICS AND *ARAL*

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APPLIED LINGUISTICS AND THE *ANNUAL REVIEW OF APPLIED LINGUISTICS*

Robert B. Kaplan
William Grabe

INTRODUCTION

The *Annual Review of Applied Linguistics* is celebrating its 20th anniversary, and we are happy to report that applied linguistics is still with us. We also believe that the field of applied linguistics is here to stay, much as psychology and English literature are disciplinary fixtures after having developed in the early 20th century. The development of a disciplinary field, however, is a messy undertaking, typically driven by needs and purposes that extend beyond individual goals or planned group purposes. In the case of applied linguistics, its continued development can only be channeled and planned indirectly. Moreover, full disciplinary acceptance will only occur to the extent that applied linguistics responds to wider societal needs and its expertise is valued by people beyond the professional field. Applied linguistics, as an inter-disciplinary field, faces the additional challenge of trying to cohere around a set of central notions with which a diverse group of practitioners can identify. So, while some may want an orderly blueprint for disciplinary development and acceptance, and some practitioners may generate discussions around such orderly expectations, none is likely to arise. At the same time, certain events and institutional structures help to shape and form the discipline without recourse to any neat blueprint. Examples include the establishment of the English Language Institute at the University of Michigan in 1941, the establishment of the Department of Applied Linguistics at Edinburgh in 1956, the establishment of the Center for Applied Linguistics in Washington, DC in 1959, the formation of the TESOL organization in 1966, and the formation of the American Association for Applied Linguistics in 1977.

Also among the shapers of this new field are the various journals that have promoted the work of applied linguists and that, as a secondary force, have helped determine what counts as applied linguistics. The first such journal, *Language Learning*, is now in its 50th year of publication. The emergence of *TESOL Quarterly* in the 1960s created an important research voice for second language researchers and practitioners. In the late 1970s and early 1980s, a number of journals more specifically devoted to applied linguistics made their appearance and helped shape a newly forming field: *Applied Linguistics*, *Applied Psycholinguistics*, *Australian Review of Applied Linguistics*, *English for Special Purposes*, *Studies in Second Language Acquisition*, and the *Annual Review of Applied Linguistics (ARAL)*. As the two Editors of the first 20 volumes of the *ARAL* series, we believe that *ARAL* has contributed to the emergence of "messy" applied linguistics as a disciplinary field. In the sections to follow, we examine the complexities and difficulties involved in granting disciplinary status to applied linguistics, the role of *ARAL* as a contributor to the development of applied linguistics, and a small set of predictions for the future of applied linguistics. After twenty years of intense professional development beyond the early decades, applied linguistics is still a discipline in search of broader recognition and internal stability. The difficulties in describing the status of applied linguistics were also apparent at the 1999 *Association Internationale de Linguistique Applique* (AILA) Congress in Tokyo, Japan.

APPLIED LINGUISTICS: THE ONGOING DEBATES

At the recent 1999 AILA Congress in Tokyo, there were several public discussions of "the field of applied linguistics": on its scope, on its status, on its emergence as a field, and on its viability as a discipline. There were also several discussions concerning the paradigms that inform the field, the political place of the field in the academic landscape, and the means and content for training the next generation(s) of applied linguists. Not surprisingly, participants in these debates agreed on only a small set of key points and differed considerably on a large number of issues. The commonalities, while few and seemingly meager, nonetheless, provide the anchor for discussing applied linguistics as an inter-disciplinary field. Most applied linguists would agree on the following points:

First, applied linguistics has many of the markings of an academic discipline: professional journals, professional associations, international recognition for the field, funding resources for research projects, a large population of individuals who see themselves as applied linguists, trained professionals who are hired in academic institutions and elsewhere as applied linguists, students who want to become applied linguists, and recognized means for training these students to become applied linguists.

Second, there is a general recognition that linguistics needs to be included as a core knowledge base in the work of applied linguistics, even though the purpose of most applied linguistics work is not merely to "apply linguistics" to achieve a solution.

Third, applied linguistics is grounded in real-world language-driven problems and concerns (primarily by linkages to practical issues involving language use, language evaluation, language contact and multilingualism, language policies, and language learning and teaching). There is also, however, recognition that these practically driven problems have extraordinary range, and this range tends to dilute any sense of common purpose or common professional identification among practitioners.

Fourth, applied linguistics needs to incorporate other disciplinary knowledge beyond linguistics in its efforts to address language-based problems. Applied linguists commonly draw upon, and are often well trained in, psychology, education, anthropology, political science, sociology, measurement, computer programming, literature, and/or economics.

Fifth, following from points three and four above, applied linguistics is an interdisciplinary field since few practical language issues can be addressed through the knowledge resources of any single discipline, including linguistics.

Sixth, applied linguistics commonly includes a core set of issues and practices that are readily identified as work done by many applied linguists (language teaching, language teacher preparation, and language curriculum development).

Seventh, applied linguistics generally incorporates or includes several further identifiable sub-fields of study: bilingual studies, corpus linguistics, forensic linguistics, language contact studies, language testing, language translation and interpretation, language use in professional contexts, lexicography and dictionary making, literacy, second language acquisition, and second language writing research. Some members of these fields do not see themselves as applied linguists, though their work clearly addresses practical language issues.

Eighth, applied linguistics often defines itself in such a way as to include additional fields of language-related studies (e.g., first language composition studies, first language literacy research, language and literature, language pathology, and natural language processing). The large majority of members of these fields do not see themselves as applied linguists, but the broad definition gives license for applied linguists to roam across these disciplines for their own goals.

The commonalities above, in and of themselves, also point out the difficulties involved in defining applied linguistics, determining its scope, identifying its membership, highlighting its practices, and preparing new members for the field. At one level, defining applied linguistics can be relatively easy; one could say that applied linguistics is the field characterized by the above eight common points. At another level, the term *applied linguistics,* raises fundamental difficulties, if for no other reason than that it is difficult to decide on what counts as "linguistics." Does linguistics incorporate the range of competing theoretical views of language description commonly discussed as linguistic theories? Does linguistics include the work of descriptive grammarians and corpus linguists? Does linguistics include the work of prescriptive grammarians and stylists? Does linguistics include the so-called hyphenated sub-fields: computational linguistics, critical linguistics, forensic linguistics, historical linguistics, pragmatics, psycholinguistics, sociolinguistics, and so on? Does linguistics center on sentences and smaller structural units, or does it center on discourse patterns and language uses? Perhaps, more importantly, what underlying assumptions are held by competing views of what counts as linguistics? The answer to many of these questions, it would seem, is "it depends." Given these difficulties within linguistics proper, it is perhaps unfair to expect clean solutions and clear delimitations for defining applied linguistics.

One alternative perspective to adopt in defining applied linguistics is to examine the contributions made by institutional structures (schools, research centers, associations, journals) to knowledge building. They represent important, if sometimes covert, defining structures within a discipline. We believe that *ARAL* has played such a role, and its history is one that parallels the evolution of applied linguistics as a discipline. We therefore see it as a fitting introduction to this exploratory volume to set the stage by examining the contribution that *ARAL* has made to the field of applied linguistics.

THE *ANNUAL REVIEW OF APPLIED LINGUISTICS*: 20 YEARS AND COUNTING

1. The background

ARAL is twenty years old. This seems an appropriate time to record its history before all the players become inaccessible. The history of *ARAL* is intimately intertwined with the history of the American Association for Applied Linguistics (AAAL) and with the history of the journal *Applied Linguistics (AL)*, all of them being of essentially the same vintage. Additionally, several of the key players have been involved in all three activities. We hope that the historical narrative that follows offers a coherent interpretation of the development of *ARAL* and, by implication, of events in the more recent development of applied linguistics as well.

2. The history of AAAL

At the TESOL conference in San Juan, Puerto Rico, in early May of 1973, a small group of people came together (not in a formal sense, but in a casual series of informal hallway and dinner conversations) to discuss the desirability of forming an American Association for Applied Linguistics (originally conceived of as an Association of Applied Linguists) and a journal for the field. (For a listing of key dates in the history of applied linguistics, see Kaplan 1997:19.) Among the people involved were Edward Anthony, Thomas Buckingham, Peter Collier, David Eskey, Robert Kaplan, Joe Darwin Palmer, Bernard Spolsky, and Peter Strevens. It seemed clear to that group that the need for such an organization existed. In the

1970s, applied linguists really had no professional home in which to meet and to discuss their work. The Applied Linguistics Interest Section (not created until 1975) in TESOL suffered (as it perhaps still does) from inadequate budget and inadequate presentation, meeting, and discussion time within the framework of the annual Teachers of English to Speakers of Other Languages (TESOL) conference, being in competition with a growing number of other Interest Sections and activities of the association. (It must be noted that the ***T*** in TESOL stands for ***Teachers***; thus, TESOL was and remains primarily a teachers' association, not a scholarly, research oriented body.)

There was, in addition, a serious fragmentation of the field because those applied linguists working in the context of teaching English as a second (or foreign) language (TESL/TEFL) came to the TESOL conferences, but those working in other areas did not. Instead, they often attended meetings of the American Council on the Teaching of Foreign Languages (ACTFL); the then Association of Teachers of English as a Second Language (now Administrators and Teachers in English as a Second Language [ATESL]; a section of the (then) National Association for Foreign Student Affairs [NAFSA], now NAFSA: Association of International Educators); the Conference on College Composition and Communication (CCCC); the Linguistic Association of Canada and the United States (LACUS); the Linguistic Society of America (LSA); the Modern Language Association (MLA); the National Association for Bilingual Education (NABE); the National Council of Teachers of English (NCTE), The Speech Association of America (SAA), not to mention a number of associations of teachers of particular languages (e. g., French [AATF], German [AATG], Japanese [ATJ], etc.). Applied linguists also regularly attended non-associational structures such as the Georgetown University Roundtable on Languages and Linguistics (GURT). But even in the reasonably 'affluent' 1970s, the notion of attending more than two conferences a year was prohibitive both in terms of financial support and in terms of time away from primary responsibilities. In addition, there was a strong sense among applied linguists that the United States ought to belong to the *Association Internationale de Linguistique Appliqué* (The International Association of Applied Linguistics); none of the associations mentioned above were eligible for such membership. Some 100 applied linguists across the United States were polled, and there was a clear sentiment for the establishment of such a new association. (Initially, the Center for Applied Linguistics served as the official American representative organization associated with AILA from AILA's inception in 1964 to 1978, at which time AAAL assumed this role.)

As a result of these pressures to organize, a more general open meeting was convened in conjunction with the Summer Institute of the Linguistic Society of America (LSA) in Ann Arbor, Michigan, on 3 August 1973. The reaction at the open meeting was somewhat less enthusiastic, and the following day, at the business meeting of the LSA, a resolution was passed requesting the LSA Executive to study the possibility of convening a subsection concerned with applied linguistics within the LSA. At the regular annual business meeting of the LSA on

29 December 1973, the matter was discussed again; the LSA Executive suggested that applied linguists were welcome at LSA meetings so long as they adhered to its quality standards. It was further agreed that there would be no special section of the LSA for applied linguists; it was also decided that, for at least two years, no further action would be taken and that the receptivity of the LSA to the idea would be re-evaluated on the basis of the experience of those years. (In fact, the matter was overtaken by time and allowed to lapse for lack of interest on the part of the LSA Executive.)

During that two year hiatus, the constitution of TESOL was amended (1975) to permit the existence of special interest sections. Among the first special interest sections to be established was one in applied linguistics; Bernard Spolsky was appointed first chairperson of the group. Subsequently its next five elected chairs were, in chronological order, Robert Kaplan, David Eskey, Thomas Buckingham, Joe Darwin Palmer, and Eugene Brière. For a time, it was hoped that this interest section would obviate the necessity for a separate organization. The LSA did, in fact, also include, in its annual meeting in San Francisco in December 1975, a section on language acquisition intended to serve the needs of applied linguists. The TESOL Applied Linguistics Interest Section also mounted a special program segment at the New York convention in 1976, at the Miami convention in 1977, and at the Mexico City convention in 1978. The first two of these program segments were largely concerned with English for Special Purposes and were organized with the close cooperation and assistance of the British Council.

It became clear, however, that these various efforts did not serve the broader needs of the applied linguistics community and that a new independent organization was desirable. At the TESOL Convention in Miami in April 1977, a round table discussion of the 'scope of applied linguistics' was convened. The participants in that roundtable were H. Douglas Brown, S. Pit Corder, Paul Holtzman, Robert Kaplan, Tony Robson, Bernard Spolsky, Peter Strevens, and G. Richard Tucker. In addition, Thomas Buckingham and David Eskey, acting as the officers of the Applied Linguistics Interest Section of TESOL, collected in advance a series of statements on the scope of applied linguistics from well-known scholars in the field. (In addition to roundtable participants, those invited included Edward Anthony, Russell Campbell, Francisco Gomes de Matos, Stephen Krashen, and John Oller. All the papers of the roundtable were published as Kaplan [1980]; a paper by David Ingram of Australia was added.)

At the conclusion of the several presentations, there was again an open discussion of the desirability of forming a new association. That discussion was quite positive, and out of it grew a mandate to move forward with the notion. During the summer months of 1977, an executive committee (Randall Jones, Robert Kaplan, Wilga Rivers, Bernard Spolsky, G. Richard Tucker) and several interim committees were formed. A formal constitutional convention was convened in conjunction with the ACTFL Conference in San Francisco on 24

November 1977, and the American Association for Applied Linguistics (AAAL) came into existence; Wilga Rivers was elected its first president (Roger Shuy was VP; Bernold Spolsky was S/T; Executive Committee members were Charles Ferguson, Betty W. Robinett, Albert Valdman, and G. Richard Tucker). AAAL became an affiliate of AILA soon after AILA held its fifth triennial world congress in Montreal in August 1978.

As a kind of footnote to the discussion, James Alatis (then Executive Secretary of TESOL) was strongly opposed to the formation of a new association. He rightly feared that a new association would draw applied linguists away from TESOL. Over time, his fear has been justified; applied linguists have largely deserted TESOL (and many of the other associations mentioned above). In the early years of its existence, AAAL elected to meet annually with the LSA, but that proved—for a variety of reasons—to be an unsatisfactory arrangement. In 1991, in New York, AAAL began to meet contiguously with TESOL; that arrangement continues at the present time (Kaplan 1998).

3. The history of two applied linguistic journals

There could not have been so much activity surrounding the creation of a new organization without comparable discussion of the vehicle(s) through which the new association was to voice its views. Among the various conversations that took place at the critical Puerto Rico TESOL conference in 1973, some dealt directly with the question of a journal (largely those involving Peter Collier). At the time that those discussions were being held, the British Association of Applied Linguistics (BAAL) had been in business for some five years, but it did not yet have a journal of its own. About 1976, serious discussions began toward the creation of a journal of applied linguistics. These discussions, always centering on Oxford University Press (OUP), involved J. P. B. (Patrick) Allen, Simon Murison-Bowie (then of OUP), Robert Kaplan, Bernard Spolsky, Henry Widdowson, and others. The notion was to create a 'transatlantic' journal serving the needs of both AAAL and BAAL.

Applied Linguistics: The journal *Applied Linguistics* (*AL*) was founded in 1980. It was jointly sponsored by AAAL and BAAL, was published by OUP, and has regularly had joint editors, normally one from North America and one from the UK. In the late 1970s, some individuals at OUP felt the need for a journal to support the kind of applied linguistics textbook publishing effort under way at OUP.[1] The only journal OUP had in the general area was *The English Language Teaching Journal (ELTJ)*, which, while being the most respected and oldest journal for language teachers, did not address the more theoretical bases of the profession. At the time, OUP also distributed the *International Review of Applied Linguistics* (*IRAL*), but this journal has not consistently served the wider applied linguistics community.

At the time when these discussions were taking place, OUP had for a number of years worked with J. P. B. Allen (for example, on the *Edinburgh Course in Applied Linguistics*, 4 vols., 1972–1977; and H. G. Widdowson (for example, *Teaching Language as Communication,* 1978), and both of them indicated an interest in editing a new journal of the sort being discussed. The aim of that journal, as stated on the inside back cover of Vol. 1, No. 1 and still regularly noted in every issue, was:

> ...to promote a principled approach to language education and other language related concerns by encouraging inquiry into the relationship between theoretical and practical studies. The journal is less interested in the ad hoc solution of particular problems and more interested in the handling of problems in a principled way by reference to theoretical studies...

The idea was tested out on a number of linguists and applied linguists, seeking geographic as well as professional spread, and testimonials were solicited. A proposal to publish the journal was approved by the Delegates of OUP (a board of university appointees chaired by the Vice Chancellor). From the earliest stages of the journal, OUP sought to link subscription to *AL* to membership in professional associations. The British Association for Applied Linguistics (BAAL) was the first organization to enter into such a relationship, and the American Association for Applied Linguistics (AAAL) soon followed, so that Vol. 1, No.1, published in the Spring 1980, was jointly sponsored by those two bodies. As a consequence of that relationship, Bernard Spolsky (then on the faculty at the University of New Mexico) joined J. P. B. Allen and H. G. Widdowson as editors. An editorial board of 22 academics (representing Australia, Canada, Finland, Germany, Israel, Poland, Singapore, Sweden, Switzerland, the United Kingdom, and the United States), plus two representatives of OUP (Simon Murison-Bowie was one), was formed. Both AAAL and BAAL had the right to nominate a board member. The board remained essentially unchanged for the first seven years of its existence, though Alan Davies and Elaine Tarone replaced J. P. B. Allen and H. G. Widdowson from Vol. 6. Beginning from Vol. 8 (1987), a number of administrative changes were introduced. Bernard Spolsky resigned as editor and was replaced by a reviews editor; Kari Sajavarra, from Finland, was the first holder of that post. The original 22-person board was replaced by an Advisory Board consisting of the BAAL and AAAL representatives (initially John Trim and Susan Gass, respectively). Christina Whitecross at OUP became the publisher. An eight-person editorial panel was appointed. From Vol. 6 (1985) the International Association of Applied Linguistics (AILA) added its formal support to the journal; that support was duly approved at the 1984 AILA Congress in Brussels.

From the beginning, *AL* has published a number of seminal articles for the applied linguistics field. In Vol. 1, No. 1, the article "Theoretical bases of communicative approaches," by M. Canale and M. Swain appeared, and a number of other key articles have been published over the years. Through a balanced mix of articles, reviews, and thematic issues, *AL* has mapped the development of the discipline in a serious and non-trivial way.

Annual Review of Applied Linguistics: The *Annual Review of Applied Linguistics* (*ARAL*) has had a rather different history. In 1978, when AAAL was created and discussions of a journal were being widely held, Henry Birnbaum (now deceased, originally a mathematician, later a United States government science administrator and ultimately international advisor to the President of the University of Southern California) suggested to Robert Kaplan that no scientific field could long survive without an annual review of research. The idea captured Kaplan's imagination. He held conversations with a number of people, and eventually asked Randall Jones (Brigham Young University) and G. Richard Tucker (by then Director of the CAL) to join him as the first editors of an annual review. Having an editorial board, a general plan for the journal evolved—a full review of the field every fifth year and special topical issues in the interim years. Kaplan approached Rupert Ingram, then owner and publisher of Newbury House, with the idea. Ingram was interested. The editorial board decided on approximately a dozen topics to be covered in the first volume—bilingualism, computer-assisted instruction, language testing, macro-sociolinguistics and micro-sociolinguistics, notional-functional teaching approaches, pidginization and creolization, structural-cognitive teaching approaches, psycholinguistics, second-language acquisition, sign language, and theoretical issues in sociolinguistics. The editorial board identified a number of authors to be invited to submit contributions in these areas, and contributions were ultimately received from Jenny Barnett, H. Douglas Brown, Alfonso Caramazza and Michael McCloskey, Joshua Fishman, Francisco Gomes de Matos, Matthias Hartig, Lilith Haynes, Braj Kachru, Rachel Mayberry, John Oller, Frank Otto, Jack Richards, and Loreto Todd. The editor, Robert Kaplan, wrote the introduction to the first volume, as he did for the next nine volumes.

In 1985, a misunderstanding with Newbury House caused Kaplan to enter into discussions with Cambridge University Press [CUP]. All subsequent volumes of *ARAL*, beginning with volume 5, have been published by Cambridge University Press. Unfortunately, the first four volumes are no longer available. The on-going relationship with CUP has been quite successful though the nature of *ARAL* does cause some marketing problems. *ARAL* looks like a journal and is produced by the journals division, but it is an annual and not really a journal. This has led to some regrettable confusion. *ARAL* has, for quite a number of years, been made available at reduced rates to members of AAAL, BAAL, and TESOL. Somewhat more than 1,000 copies of *ARAL* are sold annually by CUP (including back issues).

The *ARAL* Editorial Board has, over the years, made several strategic innovations; the journal would have a running bibliography of all works cited, a topical index (a listing that has begun to serve as a definition of the scope of applied linguistics—see Grabe and Kaplan 1992: 3-4), and a contributor index. (As the series grew longer, certain compromises have had to be made to prevent the three indices from overwhelming the volumes.)

ARAL would always publish only solicited articles (no unsolicited contributions), and—since all articles were, by definition, review articles accompanied by extensive reference lists—it would not publish separate book reviews. The primary focus of the review articles was to be on critical research in the preceding two to three years, but with the assumption that reference lists were free to cite seminal works in the area regardless of date of publication. Reference lists have always consisted of annotated and unannotated entries. The series would publish in American English, but it would strive for broad international representation. Beginning with Volume 6, each issue has carried a running index of authors cited and subjects covered; because the author index and the subject index became overwhelming, only the preceding five years' citations are available in any given volume after number 7. A contributor index was also added beginning with volume 5; it now lists contributors from the preceding decade. It was the intent that these several indices would become citation indices for the field.

The first issue appeared in 1981 with a title showing the preceding year (1980). Beginning in 1994, the cover date was adjusted to reflect the year of publication rather than the year covered in the research (e. g., Volume 13, published in 1993, carried the cover date 1992, Volume 14, the transitional issue published in 1994, carried a cover date of 1993-94, and Volume 15, published in 1995, carried the cover date 1995). (Incidentally, 1981 was the only year in which a hardback version was published.) From Volume 1, the first issue, through Volume 8, Kaplan, with the able assistance of his wife, Audrey Kaplan, produced camera-ready typescript copy. It was not until Volume 9 that manuscript preparation was shifted to electronic word-processing. Over the years, there was only one single issue (Volume 8) which utilized a guest editor; Christopher Brumfit edited that volume, a special issue on Communicative Language Teaching. Otherwise, the full editorial responsibility rested with Kaplan as the editor-in-chief through 1991.

The Editorial Directors, meeting annually in face-to-face conversation, usually during the AAAL or TESOL conferences, identify the focus of each volume, the topics to be covered, and the individuals to be solicited to contribute, based on discussions of ideas circulated in advance by the editor-in-chief. The Editorial Directors are thus always working with three years of *ARAL* each time they meet—one that is about to appear (or has just appeared), one that is well along in the editorial process, and one that is in its formative stage, two-years out.

Gradually, the role of the Editorial Directors has evolved, and the members of the Board have changed—fixed terms were instituted beginning with volume ten. Over the years—in addition to Jones (who withdrew after Volume one), Kaplan, and Tucker—Alison d'Anglejan, J Ronayne Cowan, Charles

Ferguson, William Grabe, Braj Kachru, Mary McGroarty, Merrill Swain, H. G. Widdowson, and Janice Yalden have at various times served as Editorial Directors for varying periods of time. Grabe, Kaplan, Tucker, and Widdowson, have served for the longest terms. The composition of the Editorial Directors has always striven for international representation and gender balance. In 1989 (Volume 9), an Editorial Advisory Board was added, normally consisting of approximately 10 internationally recognized scholars. The first advisory board included Aura Bocaz (Chile), Moira Chimombo (Malawi), Michael Clyne (Australia), Biodun Goke-Pariola (Nigeria), Andrew Gonzalez (Philippines), Sayyid Hurreiz (Sudan), Peter Nelde (Belgium), Bernard Spolsky (Israel), R. N. Srivastava (India), and John Kwock-ping Tse (Taiwan). The function of the advisory board has been to suggest areas and contributors for scholarship to be covered.

With the completion of the eleventh volume (1991—jointly edited by Kaplan and Grabe), Kaplan resigned as editor-in-chief (though he remained on the editorial board through Volume 20, at which point he retired from service to *ARAL*) and was succeeded by William Grabe as editor-in-chief. Grabe, in turn has served ten years as editor-in-chief and, with this twentieth volume, relinquishes that role to Mary McGroarty.

4. Topics covered in *ARAL*

The shaping influence of a broader interpretation of applied linguistics is partly reflected in the thematic volumes produced in the *ARAL* series, and also the themes repeated over ten-year cycles. For example, the first ten years covered language and language-in-education policy (Volume 2), discourse analysis (3), literacy (4), multilingualism (6), language use in the professions (7), communicative language teaching (8), and second language acquisition (9). In the second decade, a number of basic themes were revisited: language policy, literacy, discourse analysis, and multilingualism. In addition, a volume was developed to examine technology and language and two volumes were devoted to language teaching concerns. An effort was made to plan for a language-teaching-related volume to appear every fifth year (beginning with Volume 8). Beginning with Volume 15, a plan has been developed to produce overview volumes with a greater consistency of topical coverage; so overview Volumes 15 and 19 both include sections on second language acquisition, language assessment, and language uses in various professional and public contexts. This consistency of topical coverage also meant that *ARAL* does not need to publish separate thematic volumes on second language acquisition, language assessment, or language use in professional and public contexts. Rather, the inclusion of these topics in regular overview volumes ensures a more frequent updating of changes and innovations in these areas, particularly since overview volumes are now to be published every four years rather than every five years.

Aside from the general field coverage of applied linguistics projected by volume themes and overviews, the specific topical coverage of the volumes is meant to reflect evolving perspectives among applied linguistics. This currency of topics is reflected in the subject index at the back of each *ARAL* volume, providing a snapshot of the issues addressed in the prior five years. Because the *ARAL* subject index changes completely over a period of five years, shifts, trends, and continuities in applied linguistics can be explored in one way by comparing the subject indexes from Volumes 9, 14, and 19, for example. Of course, a similar content analysis approach could be applied to other key applied linguistics journals, and a multiple journal comparison might be instructive for the field.

We have argued in this section that *ARAL*, along with a few other publications, has had and is having a consistent shaping influence on the field of applied linguistics. This influence is not one that can be readily demonstrated in any simple way since such a demonstration would belie the complex and messy nature of a disciplinary field's development and evolution. The topics emphasized in *ARAL* over the past two decades reflect the central sub-fields that are typically included under applied linguistics in discussions and debates. The related fields that are only sometimes incorporated into applied linguistics definitions by applied linguists themselves have also received a lesser recognition in *ARAL* volumes. By this reasoning, second language acquisition, language testing, language policy studies, multilingualism, literacy, and language uses in professional and public contexts are all fields firmly within the discipline of applied linguistics (in addition to language teaching and language-teacher training). Other fields may also be located within applied linguistics, but perhaps less clearly so by this reasoning. A further corollary implication is that applied linguistics is not a cover term simply for language teaching and language-teacher training.

THE FUTURE OF APPLIED LINGUISTICS

Applied linguists of most persuasions tend to shy away from speculating on the future of applied linguistics. However, the opportunity to influence and shape the thinking of others often falls to those who are willing to prognosticate (and who do so fairly effectively, if not completely accurately). So, in closing, we will offer a small set of tentative indications on future directions in applied linguistics research. In doing so, we wish to call attention to the fact that we are perhaps better qualified to write the history presented here (having lived it); scholars working on the cutting edges of the field should be invited to write about its future.[2] Having made our apologies for reading the future, we see four trends increasing in the coming years.

In the future, the field of applied linguistics will be defined by greater uses of technology and computer applications. Computer literacy will become an essential component of training for new applied linguists. These computer uses will be seen in new statistical approaches, computer-based testing and language learning, connectionist research on learning, technology and literacy development, corpus linguistics research and lexicography, and translation research. Tied to computer uses and technology applications will be changes in testing that better reflect recent views on validity and performance assessment. Assessment practices will take on new dimensions with the development of appropriate technology resources that are not yet ready for application or that have not yet been developed in practical ways. The rapid growth in computational power available to everyone will bring these changes about sooner rather than later. Technology resources will also influence task designs for research studies in a wide variety of ways and for a broad range of research purposes, some of which cannot even be envisioned at the present time.

A second major trend that has begun and will increase will be a move toward a more powerful version of descriptive linguistics as the central linguistic resource for research. The development of corpus linguistics is now revealing facts about language use and language variation across registers that are essential for addressing practical issues but that may be largely incompatible with many current theoretical models in linguistics. Applied linguists, who must be anchored in a 'realistic' linguistics that is discourse based, contextually framed, and grounded in attested occurrences, will move back toward analyzing new data rather than arguing new theory (though theory building is certainly possible within a descriptive-data framework; cf. Widdowson, this volume). Goals will center around understanding new facts about language rather than having language facts forced to fit preconceived theory. In the face of this disjuncture, descriptive linguistics, with its new power to enhance our understanding of language uses, will provide more fertile ground for applied linguistics. The return to descriptively powerful research will be enhanced by computer applications; by studies of language uses in legal, medical, scientific, and business contexts; by research at the discourse level (as the basic analytic unit); and by the power of descriptive analysis to provide relatively theory-neutral data for future linguistic theorizing.

A third important trend will be the increasing importance of evaluation and assessment practices. The centrality of construct validity as a driving force in language testing is already spreading beyond the boundaries of testing and into other areas of applied linguistics. In second language acquisition, there is a growing recognition that validity of task and test data is a central concern—researchers need to collect and interpret responsible evidence in support of theoretical claims (Bachman and Cohen 1998, Clapham, this volume). The critical importance of careful and thorough evaluative practices is relevant to language policy and planning efforts as well. Takala and Sajavaara (this volume) argue strongly for the central role of evaluation in the planning and implementation of language policies. The importance of evaluation practices is also being felt in classrooms and in curriculum planning. National standards efforts and the increasing demand for standardized assessments in many states in the U.S. and elsewhere highlight validity and reliability issues that will directly impact instructional practices and learning processes (Brindley 1998). Evaluation and assessment issues are no longer only the concern of language testers, and sophisticated evaluation and assessment practices will be a key concern for all future applied linguistics research.

A final area in which applied linguistics will change in new ways is in student learning. This trend will manifest itself both for all students learning languages and for undergraduate and post-graduate students studying applied linguistics. Language students will become familiar with new technologies for learning. They will become more engaged in autonomous learning while also working collaboratively within groups. They will have greater access to resources to support their learning, and they will receive more rapid feedback on their learning progress. All of these features of language learning will be even more prominent among programs that train applied linguists. Students of applied linguistics will need to master a wide range of technological skills as central components of their training. They will need to work collaboratively on research projects, as inter-disciplinary cooperation and the common use of research teams become essential to deal with larger problems implicating a broader range of disciplines and human resources. Students will engage in research practices that require strong knowledge of both quantitative and qualitative methods and their complementary contributions to knowledge making. Students will need to engage in field-work projects as applications take on larger roles than do standard knowledge-bases in training programs. Of course, these student of applied linguistics will also need current and broad knowledge of linguistics and, in all likelihood, of at least one related field. While these demands on new students may seem daunting, they are probably no more demanding than new and increasing expectations in other disciplines. It is an exciting time to be an applied linguist, and also an exciting time to learn to become one.

We believe that *ARAL*, under the guidance of its future editors and editorial directors, will continue to chart the field, to contribute to its development, and to serve as an important resource both to practitioners and to future applied linguists.

NOTES

1. We are deeply indebted to Simon Murison Bowie (personal communication) for much of the information contained in this brief sketch of the history of *Applied Linguistics*.

2. We will together undertake one more volume, outside of *ARAL*, intended to move toward a definition of the field by giving full play to its scope (Kaplan, to appear).

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LANGUAGE TEACHING AND LANGUAGE TEACHER EDUCATION

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OBJECT LANGUAGE AND THE LANGUAGE SUBJECT: ON THE MEDIATING ROLE OF APPLIED LINGUISTICS

Henry G. Widdowson

INTRODUCTION

As linguistics has extended its scope over the past thirty years from an exclusive concern with knowledge of the abstract code, what Chomsky referred to as Internalized (I) language, to a consideration of the way this knowledge is actualized in Externalized (E) language (Chomsky 1988), so it has inevitably gained in face validity as an area of inquiry relevant to practical life. A linguistics that deals with real, as distinct from ideal, speaker-listeners has a more obvious applicability to the problems real people actually have with language. Nevertheless, one cannot just assume a direct correspondence between the E externalized language the linguist describes and the E experienced language that is a reality for the user. The applicability of linguistic descriptions is a potential that has to be realized, and this is where applied linguistics comes in.

My purpose in this contribution is to look into this question of applicability as it relates to language pedagogy. My concern, in particular, is with L2 learners as a particular kind of language user: At issue is the extent to which linguistic descriptions can adequately account for their reality for learners and so provide a point of reference for the design of language courses.

LINGUISTICS AND LANGUAGE TEACHING

In traditional ways of thinking, applicability does not appear to be a problem. Since language is both what L2 teachers teach and linguists describe, it would seem self-evident that the findings of linguistics should be relevant to how the content of language courses is to be defined. Linguistics has always in fact been deferred to as the accepted authority on these matters, the assumption being that the language subject is derived from the linguistic discipline and that the units of description constitute the units for learning. On the face of it, this seems reasonable enough: If teachers cannot draw on linguistic descriptions in the design

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of their instruction, where else, after all, can they turn? But they need to know what such descriptions have to offer, and this is something that applied linguists can inform them about. In this view, the content of the language subject is necessarily dependent on linguistic description.

The assumption of necessary dependency goes back a long way. The following can be taken as a representative statement:

> He (the language teacher) is not teaching linguistics. But he is teaching something which is the object of study of linguistics, and is described by linguistic methods. It is obviously desirable that the underlying description should be as good as possible, and this means that it should be based on sound linguistic principles. (Halliday, *et al.* 1964:66).

The something that the teacher is teaching, the language subject, is here equated with the linguist's object of study, the object language. But this object is, as I have indicated, describable, and definable, in different ways. The methods and principles employed by taxonomic structuralists, for example, are very different from those of generativists of the Chomsky stamp, which are, again, very different from those of functional grammarians, variationists, pragmaticists, and so on, all of whom would claim that their descriptions are good and sound. So which object of study is to be depended upon to provide the basis for the language subject? In practice, it has been the one in current vogue. Thus, when structuralist linguistics was in the ascendancy, the content of language courses was specified in terms of sentence patterns. With the shift to the pragmatic functioning of language, the units of courses were specified in terms of communicative functions.

It seems to me that this assumption of dependency is mistaken. I want to argue that what the language teacher teaches is **not** the same as the object of study of linguistics, and that what is a 'good' description in reference to 'sound linguistic principles' cannot be assumed to be good for language pedagogy, which has its own principles to refer to. I want to argue, furthermore, that it is precisely because there is a necessary disparity between the principles of language pedagogy and those of the linguistic discipline that applied linguistics has a role to play. In this view, the purpose of applied linguistics is not to assume relevance but to question it, not to engage in application, but to inquire into applicability.

A convenient way of talking about the object of study of linguistics is in reference to Hymes' well known formulation of the components of communicative competence: the formally possible in respect to the resources of the code available, the feasible in respect to mental processibility, the appropriate in respect to the context, and the done or attested in respect to actual occurrence (Hymes 1972). The first two can be seen as features of I-language, the second two as features of E-language. Different approaches to linguistic description can be seen as giving prominence to one feature rather than another, and, as I have suggested, pedagogy has generally followed suit. Thus, with the extension of linguistic description to account for E-language, we shift from a 'structuralist' pedagogy of the possible to a 'communicative' pedagogy of the appropriate. What has been generally disregarded is that in Hymes' scheme the possible is also an intrinsic aspect of communication. This is, in part at least, because Hymes presents these different features as separate components and does not inquire into their **relationship**. I have discussed this elsewhere (Widdowson 1989), and this is not the place to deal with it again in detail, but we need to note that this matter of relationships is a crucial one, for in a normal experience of language, **all** of the features Hymes mentions come into play and interact in complex ways. If the object of description is fixated on one feature, then it cannot correspond with user reality, and this, in turn, raises questions about the relevance of any linguistic theory as a model for pedagogy.

CORPUS LINGUISTICS, AUTHENTIC LANGUAGE, AND TASK-BASED INSTRUCTION

The concern over linguistic objects of description is not limited to formal generative linguistics. Rather, this concern also extends to what is in many ways the most important and influential development in E-language description over recent years, that of corpus linguistics. The 'goodness' of a linguistic description is now increasingly being measured against corpus analyses. The computer provides us with the capability of accumulating and analyzing vast amounts of language that users have actually produced. We no longer have to depend on our own intuitions about the language that people use, or on eliciting from them what they **think** they use. We can now establish patterns of usage as a matter of observed fact. This trend is, par excellence, the description of the attested in the Hymes scheme. It is obviously a highly significant development which has already had momentous effects on linguistic description. Nobody these days would contemplate writing a grammar or dictionary which did not take account of corpus findings. But we need to note that for all the facts they reveal, and in spite of what is often claimed, these findings are confined to one feature of language, namely the attested. They do not capture an absolute reality but a partial one. So, although they provide additional information of immense interest, it would be a mistake to suppose, in our enthusiasm, that they thereby make all other accounts of language null and void.

We should recognize, to begin with, that corpus analysis is not a different and improved way of dealing with the object of study of linguistics, it changes the object of study itself. There is a radical shift from one kind of reality to another—from language internalized as competence, as something people know, to language externalized as performance, what people do. This, one might say, is a salutary shift. There was in the past too much emphasis on knowledge dissociated from behavior, too exclusive an attention paid to the possible (the encoded resources of the language as known by its users), without regard to the actually attested (what the users actually produce in the way of message forms drawn from these resources). This limitation may be conceded. But then we should be wary about going to the other extreme and denying any significance to the possible that is not attested, of taking up a neo-behaviorist position that denies any validity to knowledge that is not acted upon and overtly realized, and that takes reality to be only what can be quantitatively measured (see Widdowson 1991).

We need to note too that the object of study in corpus linguistics is a particular language in itself, *sui generis*, not as representative of language in general. We get detailed information about patterns of occurrence of English (or French or Spanish) but nothing in the way of underlying abstract categories which might relate them since these, obviously enough, are never directly manifested in behavior.

Corpus analysis, then, can only, of its nature, reveal what is overtly done (the attested message forms), not what is covertly known (the possible or encoded potential of the language). Moreover, it cannot reveal what is **meant** by what is done either. We come here to a third of Hymes dimensions of communicative competence: the appropriate, the keying of language in with context. Now we may accept that formalist linguistics, with its exclusive concern with the abstractions of the possible, is bound to represent language as remote from the experience of its users, since this knowledge only becomes a reality for users when it is actualized as behavior. But just the same point applies to the dissociation of the attested from the appropriate. What is attested is text. This is the perceptible trace of discourse enactment—that pragmatic activity whose meaning is realized in relation to contextual conditions of various kinds. It is this meaning achievement that constitutes language reality for users. People do not set out to produce texts: Texts simply occur incidentally as a consequent by-product of the discourse process. So to isolate texts from the contextual conditions of their production is necessarily to create an analytic construct which cannot represent language reality as experienced by users quite simply because users do not experience texts in contextual isolation.

The description that corpus analysis provides, then, is necessarily partial in that it privileges one aspect of language. It deals with the attested message forms, but not with the possible or potential of the code from which they are drawn, and not with the contextually appropriate conditions whereby message forms are assigned pragmatic meaning. Now it is important to stress that this view does not deny the validity of such text description, but only to recognize that, as with descriptions that privilege other aspects of language, its validity is bound to be limited. Corpus linguistics has enormous appeal, of course. It provides a genuinely innovative set of discovery procedures for revealing textual facts not immediately accessible to introspection or elicitation. But its very appeal should make us wary of any claims it might make to be a comprehensive account of language.

So far, I have discussed the descriptive adequacy of corpus accounts of language. What of its applicability for language teaching? How far can it, or should it, determine the specification of course content? In some people's minds, the relevance is self-evident, and to question it is to encourage the complacent reliance on outmoded approaches to description. This view, following the well established tradition that I referred to earlier, assumes that the language object that is described is the same as the language subject that is to be taught, and since corpus linguistics provides the best possible description, accounting for 'real' language rather than some idealized version of it, it stands to reason that its findings should determine the content of language courses. So it is that John Sinclair, who, more than anybody else, has inspired the development of corpus based descriptions of text, proposes the following precept for language teachers:

> Present real examples only (Sinclair 1997:30).

Real examples of what, though? As I have argued, all that corpus descriptions can yield are examples of **text**, and text only has reality for its producers when it contracts a relationship with context in the discourse process, in other words when the attested is **related** to the appropriate. So if textual examples are to be drawn from actually occurring usage, they can only be made real as communication if there is some context that they can be appropriately related to. In this respect, examples of the attested are no different from examples of the possible. Consider the following:

1) I have a little book here by a lady called Mystic Meg.
2) I have a little book. The book is here.

The first example is from the COBUILD Dictionary of actually occurring English and so a real example and to be deemed suitable for pedagogic presentation. The second example is a pair of sentences that I have invented myself and in this respect unreal and so presumably unsuitable. But in both cases what we have are stretches of inert language which need to be activated by some kind of appropriate contextual connection for them to be realized as meaningful. It is of course true that the first, as an instance of the attested, an extract from text, **did** originally have appropriate contextual connections, whereas the second, as an instance of the possible derived directly from the code, never did. But this distinction is pedagogically irrelevant since the original context of the first is unknown, and even if it were known could not be replicated in the classroom anyway. So in both cases the teacher has to somehow contrive an appropriate context of some kind which would make the examples meaningful to learners, and this contextualizing would be infinitely easier to do for the second example than for the first. Indeed, 'unreal' examples like the second are expressly contrived to make them realizable in the contextual conditions of the classroom. In other words, the likelihood is that the 'unreal' example can be more readily **made** real for learners than the 'real' one.

In spite of the clear benefit with the use of 'unreal' examples, there is a persistent prejudice against such contrivance. For example, Willis (1990) notes the following:

> Contrived simplification of language in the preparation of materials will always be faulty, since it is generated without the guide and support of a communicative context. Only by accepting the discipline of using authentic language are we likely to come anywhere near presenting the learner with a sample of language which is typical of real English (1990:127).

But the 'real' examples of attested text are also simplified: They are message forms that are dissociated both from their source in the code potential of the possible and from the complexity of the normal contextual conditions that made them communicatively appropriate in the first place. The original communicative context that constituted their 'guide and support' is no longer in evidence. A context has to be reconstituted in some way, and it has to be appropriate to classroom conditions. In classroom settings, it is not the case that contrived language is 'generated without the guide and support of a communicative context.' It is simply that the communicative context itself has to be contrived so as to be real for learners and effective for learning. I would argue that we must have the discipline to deny ourselves the easy assumption—that authenticity is transferable intact in the text from one context to another. What we need to recognize is that it makes no sense to present learners with 'real' examples of text unless they can make them real for themselves.

Returning to the general point, it is misleading to suppose that the object of linguistic description is the same as the subject of language teaching. What linguists produce are partial accounts of language, and different approaches to description are partial in different respects. The question is what insights can be drawn from these accounts that are relevant to the pedagogic design of language courses. Corpus description, as one kind of account, has enormous appeal. A description that promises to provide real English for the first time is bound to be appealing to teachers. Who wants to be accused of teaching **un**real English? *Real, authentic, naturally occurring* are expressions which have (in corpus linguistic terms) a positive prosody, and *unreal, inauthentic, contrived, artificial* a negative one. The appeal is difficult to resist.

This allure is all the more reason for questioning its validity for language teaching. The direct application of corpus description to language teaching is rooted in a misconception about the nature of the language subject. The language subject is not the same as the language as known and experienced by its users. It is something which is necessarily designed to account for the fact that the language is **foreign**. The reality of the language for its users is a function of its familiarity. The reality of the language for people learning it is precisely the opposite: It is a function of its **un**familiarity, its **foreignness**, something that primary language users cannot possibly experience. And the language will, of course, be foreign in different ways for different groups of learners. It is this foreignness that the language subject has to be designed to accommodate. So there are two kinds of language reality here. The interesting question is how they are to be related, what relevance the description of one might have for the design of the other. But it will not do to conflate the two, or seek to impose one on the other by fiat.

It is not only in the specification of course content that we find what we might call the dogma of the authentic, the uncritical belief in the transferability of reality from the context of use to the context of instruction. We find it too in the design of classroom activities where language is not just presented but engaged with so as to activate the learning process. The activity which has been particularly commended over recent years is the **task**. This involves the learner in using language contingently to solve a problem and, as such, is defined as distinct from an exercise, which simply requires the learner to solve a language problem *per se*. The design of a task has to satisfy two crucial pedagogic conditions. One is that the problem that is set has to engage learners in what they will take as purposeful activity; in other words, it has to be appropriate to their reality. The second is that it has to be effective in activating their learning, which means that it has to develop their knowledge of the possible, the meaning-making potential of the code. Neither of these conditions depends on replicating the reality of **user** experience. And yet those who talk about tasks regularly invoke this reality as a necessary design feature. Thus it appears as one of the criteria that Skehan (1998) specifies as definitive of a task

> ...a task is regarded as an activity which satisfies the following criteria:
> Meaning is primary.
> There is a goal which needs to be worked towards.
> The activity is outcome-evaluated.
> There is a real-world relationship (1998:268).

He comments on this issue as follows:

> ...the real-world relationship implies that an activity focussed on language itself cannot be a task. A transformation drill, for example, is an activity which fills class time, but does not happen in the real world and so fails to meet this criterion (1998:268).

The assumption Skehan makes here is that, as with Willis's communicative contexts, there is only one real world—that of the language user—and this must be replicated if the learning activity is to be valid. However, this assumption ignores the fact that what happens in the real world of language users may be utterly unreal for learners, for they inhabit quite different worlds. Furthermore, learners are quite capable of creating worlds of their own, of appropriating the language to their own purposes and making it real for themselves on their own terms. Even such activities as a transformation drill can be converted by learners into something real and meaningful whereby they exploit the very foreignness of the language (see Kramsch and Sullivan 1996, Sullivan to appear). Learners can engage with language, and learn from it, without reference to the kind of transactional goals and outcomes by which user-language use is evaluated. They may indeed subvert presumed goals and outcomes by language play, which, as Cook (1997; 2000) argues, has a powerful reality of its own and is an effective device for learning for children and adults alike.

LINGUISTICS, LANGUAGE TEACHING, AND APPLIED LINGUISTICS

The object language which linguists describe is, then, one kind of reality: that of user experience in the contexts of 'normal' social interaction. The language subject is another and quite different reality, one which has to be contrived to be appropriate to other contextual conditions. Looking into the relationship between them, between linguistic description and pedagogic design, is a matter of mediating between two domains of inquiry, each with its own principles and conditions of adequacy. It is this mediation which is the central business of applied linguistics. In the past, the orthodox view was that the language subject and the object language of description were the same and that, since linguists were expert in description, they had the authority to tell teachers what to teach. Given the academic prestige of linguistics, and the relatively humble status of pedagogy, teachers have tended to concede the authority. This persistent belief in unmediated application necessarily denies any distinctive role for applied linguistics and simply equates it with linguistics applied (see Widdowson 1980), which linguists can do for themselves: Mediation is merely meddling. Such a position would seem to be John Sinclair's view:

> Applied linguists, I have the impression, see themselves as mediators between the abstract and heady realms of linguistic theory and the humdrum practical side of language teaching (1998:84).

As far as I am concerned at least, the impression is entirely correct. As an applied linguist, I do indeed see myself as a mediator. From the perspective of outsiders, linguistic theory may indeed be a heady realm, and language teaching humdrum practice. And this is just the kind of difficulty that mediation has to deal with by showing that what is commonly dismissed as heady and abstruse can also be interpreted as providing a legitimate intellectual perspective, that theory can be relevantly related to language teaching (as to other areas of practical life) to make it more meaningful and less humdrum. Without mediation, the domains remain self enclosed: The heady just remains heady, the humdrum humdrum.

One might, of course, accept the need for mediation but deny the need for mediators, arguing that linguists are perfectly capable of doing it for themselves. The evidence would seem to indicate, however, that they find this difficult to do. This is not surprising, actually, for it would require them to distance themselves from their own disciplinary perspective and relate linguistic knowledge to a quite different perspective. Linguists have authority in their own domain: They describe language **on** their own terms and **in** their own terms. There is no reason why they should assume the responsibility of acquiring expertise and authority in the quite different domain of language pedagogy. It is not their business. The linguist, qua linguist, is in no position to judge the pedagogic relevance of linguistic theory and description, and some linguists recognize this well enough. Chomsky is one of them.

It is often pointed out that Chomsky, in a talk at a teachers' conference in 1965, expressed his own skepticism about the relevance of linguistics for language teaching (and by implication the validity of applied linguistics), and his remarks are frequently cited, with some glee, as if they settled the question once and for all. But Chomsky, as linguist, has no authority to pronounce on the matter, and right at the beginning of his talk he makes his position quite plain:

> I should like to make it clear from the outset that I am participating in this conference not as an expert on any aspect of the teaching of languages, but rather as someone whose primary concern is with the structure of language and, more generally the nature of cognitive processes (1966:43).

And later in his talk we find the following disavowal:

> It is possible—even likely—that principles of pyschology and linguistics, and research in these disciplines, may supply insights useful to the language teacher. But this must be demonstrated, and cannot be presumed. It is the language teacher himself who must validate or refute any specific proposal. There is very little in psychology or linguistics that he can accept on faith (Chomsky 1966:46).

As we have seen, not all linguists would be so cautious and deferential. Some would assume usefulness without further ado and presume to propose precepts for teachers based on linguistic authority. One might, of course, retort that what Chomsky says applies to **his** linguistics, a linguistics only of the possible, an idealized, armchair abstraction which everybody knows is useless because it does not describe use. With linguistic description that deals with attested reality, the situation is different.

But how is it different? To begin with, a moment's reflection will reveal that Chomsky's linguistics was not useless at all. It had an enormous influence on how people concerned with pedagogy thought about language. His insights effectively led to a fundamental reconceptualization of the nature of the language learning process, and consequently of how language was to be defined as a subject. It was Chomsky who challenged the orthodox pedagogic view of the time that learning was a matter of habit formation to be induced by pattern practice and structural drill whereby learners were constrained into conformity. He made us conceive of learning in a totally different way, as an essentially cognitive and creative process in which there was room for learner initiative. This reorientation, in turn, led to a revision of the concept of error and a radical reappraisal of teacher and learner roles. All of the ideas about autonomous learning, problem solving, the distinction between overt participation and covert engagement, and the defining of classroom activities in terms of tasks rather than exercises can be traced back to Chomsky's insights about the nature of language.

These pedagogic consequences, however, were not a matter of direct application but of indirect implication. As has been frequently pointed out, attempts to formulate course content in reference to formalist categories proved to be misguided. What was significant about Chomsky's ideas was that they led those concerned with pedagogy to redefine the nature of the language subject in cognitive rather than behaviorist terms. It is a nice irony that the current rejection of his linguistics of the possible in favor of the linguistics of the attested marks a return to behaviorist principles. Clearly, however, students do not learn a language by accumulating message forms, but only by inferring from them some underlying encoded potential; in other words, they learn by relating the attested to the possible, and the subject has to be designed in such a way as to guide them to do this. But learning cannot occur if it is determined directly by a description that only deals with overt attested behavior, particularly if this behavior is only that of the experienced language of the user. Here we return to the distinction made earlier between the object language of user experience and the language subject as designed for learners. The point I made about the language subject was that it was essentially concerned with the foreignness of the language and so could not be equated with the language of familiar user experience. Since this foreignness can only be recognized in relation to another language, it follows that English (or French, or Spanish) as a foreign language is necessarily a bilingual subject. Students learn the foreign language in relation to the language (or languages) they already know. They can only relate the language they know to the language they do not by reference to abstract categories of the possible.

To the extent that the language subject must incorporate the possible, it cannot be defined in reference only to descriptions of the attested. Both aspects of language have to be taken into account. And both, as I indicated earlier, have to be related to the appropriate. Whether one is drawing the content of courses from message forms which are contrived exemplifications of the code, or from message forms which are sampled from actually occurring text, they need to be made real for the learner. The message forms have to be made locally appropriate to the different classroom contexts in which learners find themselves.

What I have said about the necessary adequacy of linguistic descriptions as models for course design applies both to formalist approaches and to the findings of corpus analysis. Both provide insights into language of immense interest, but their pedagogic usefulness for the language subject 'must,' in Chomsky's words, 'be demonstrated, and cannot be presumed.' The only difference is that the proponents of one approach do not presume, whereas those of the other do.

It seems to me that Chomsky, that arch fiend of useless formalist linguistics, gives us a clearer indication of the role of the linguist than many who claim a necessary pedagogic relevance for their partial descriptions of 'real' language. What he says in this regard also allows us to see where the applied linguist comes in. 'The usefulness of insights that linguistics supplies must be demonstrated,' he says, and he never said a truer word. But then who is it that does the demonstrating? Who is to be the agent? The teacher? But how do teachers recognize these insights in the first place? Linguists, as I have said, describe language on their own terms and in their own terms; in other words, they develop their own specialist discourses to suit their own disciplinary perspective on language. They would not have insights of any interest to offer if they did not. Their perspective, however, is not a pedagogic perspective. So whatever insights might be forthcoming cannot simply be **supplied**, retailed from one discourse domain to another. A third party, a mediating agent, must make these insights intelligible in ways in which their usefulness can be demonstrated. In other words, we need the applied linguist.

I have been talking here about mediating a relationship between linguistics and language teaching, the principle of mediation applies more generally to the relationship between any disciplinary discourse and the areas of its potential applicability, between abstraction and the actuality of experience. There is never any direct transference. Disciplines can, of course, and routinely do, use human beings empirically as a source of data. But you cannot then reconstitute, or replicate, human beings from the data. As we have seen, the language data that corpus linguists describe may reflect one kind of reality, but it is not one that can be equated with the reality that students experience when they are learning a foreign language in the classroom. Whatever insights such description offers, they are a function not of transference but of translation, mediated into a form where their usefulness might be realized. They cannot just be supplied.

So linguistic insights are created by mediation. But, equally, so is the usefulness. Applied linguistics is often said to be concerned with the investigation of real-world problems in which language is implicated. But this seems to suggest that problems, like insights, are somehow there, that somebody in the real world supplies a problem, the linguist supplies an insight, and the applied linguist matches them up. But things are not like that. To begin with, problems are perceived and formulated in culturally marked ways; in other words, they belong to particular discourses, and it is likely that they will need to be reformulated so as to make them amenable to investigation. It may indeed be the case that what people identify as a problem is simply the symptom of another one that they are not aware of. In a sense then, investigation, which of its nature belongs to a discourse other than that of the problem, will necessarily reformulate it, and change it into something else, which in turn may create problems that were not perceived at all in the first place. Just as linguistic insights are a function of the mediation, so are the problems they are related to. The process brings together two discourses, or two versions of reality, and this requires an adjustment of fit whereby an area of convergence is created, compounded of elements of both discourses but belonging exclusively to neither.

Since the area of convergence belongs to neither discourse, proponents of both are likely to be somewhat ambivalent about it. Thus language teachers, for example, may, and indeed often do, think of mediation as an unwanted, and unwarranted, intrusion on their domain. And there are times when it is: when we get linguistics applied, as distinct from applied linguistics, the process whereby linguistic findings are foisted on pedagogy on just the presumption of relevance that Chomsky warns us against. Conversely, linguists may feel that the area of convergence is a misrepresentation that disfigures their discipline. Applied linguists thus find themselves in an anomalous position, in a no-man's land they have made for themselves, and not infrequently under fire from both sides. It is not surprising that they should so often feel insecure, nor is it surprising that the straightforward unmediated process of linguistics applied should be so appealing. You only have to be a linguist to do that.

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LANGUAGE TEACHER EDUCATION

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INTRODUCTION[1]

Language teacher education programs are likely to be housed in departments of applied linguistics, education, or languages and literature: These three disciplines provide the knowledge base and opportunities for developing skills and dispositions for both prospective and experienced teachers. Until recently, applied linguistics (psycholinguistics, sociolinguistics, discourse analysis, language description, and language teaching and testing methodology) formed the core of language teacher education, not unexpected, since language teaching has historically been the primary focus of applied linguistics (Bardovi-Harlig and Hartford 1997, Crandall 1995; 1996). However, during the last decade, general educational theory and practice have exerted a much more powerful influence on the direction of the education of both preservice and inservice language teacher education, resulting in a greater focus on: 1) practical experiences such as observations, practice teaching, and opportunities for curriculum and materials development (Crandall 1994, Johnson 1996b, Pennington 1990, Richards 1990, Richards and Crookes 1988); 2) classroom-centered or teacher research (Allwright and Bailey 1991, Chaudron 1988, Edge and Richards 1993, Nunan 1989, van Lier 1988); and 3) teacher beliefs and teacher cognition in language teacher education (Freeman 1996; 1998, Freeman and Johnson 1998a, Richards and Nunan 1990). In fact, the last decade can be viewed as a search for a theory of language teaching and, by extension, of language teacher education at both the micro and macro levels (Freeman and Johnson 1998b, Johnson 1996a, Larsen-Freeman 1990, Richards 1990). Language teacher education is a microcosm of teacher education, and many of the trends in current language teacher education derive from theory and practice in general teacher education. These trends include at least four major shifts.

First, there is a shift from transmission, product-oriented theories to constructivist, process-oriented theories of learning, teaching, and teacher learning.

Traditional, transmission-oriented teaching involves top-down approaches which present best practices for teachers to understand and imitate in their teaching (Richards 1990, Widdowson 1997). Traditional teacher education views teachers as passive recipients of transmitted knowledge rather than active participants in the construction of meaning (in learning by reconstruction). Nor does it take into account the thinking or decision-making of teachers. A shift to a constructivist perspective of teaching and teacher learning makes teachers a primary source of knowledge about teaching, reflected in an increasing focus on teacher cognition (Johnson 1999, Kleinfeld 1992, Richards and Lockhart 1994), the role of reflection in teacher development (Bartlett 1990, Freeman and Richards 1993, Schon 1983; 1987), and the importance of teacher inquiry and research throughout teacher education and development programs (Crandall 1994, Freeman 1998, Wright 1992).

Second, there is a growing sense that language teacher education programs have failed to prepare teachers for the realities of the classroom. As a result, efforts are being made to transform teaching through a focus on situated teacher cognition and practice (Bruner 1986, Lave 1988) and the development of concrete, relevant linkages between theory and practice throughout the teacher education program. The host of differences in learners, programs, curricula, materials, policies, and the socio-cultural environment that teachers are likely to encounter in their careers calls into question any set of "best practices" appropriate for all contexts or any attempts to transfer the knowledge and practice from teacher education programs directly to teaching (Casanave and Schecter 1997, Freeman 1989, Holliday 1994). Decontextualized theory fails to consider the multidimensionality and unpredictability of the classroom environment (Bailey and Nunan 1996, Doyle 1986, Johnson 1996b). Partnerships between programs of language teacher education and language teaching programs or schools provide opportunities for contextualizing and integrating preservice and inservice teacher education, encouraging prospective and experienced teachers, administrators, and researchers to learn together as they also provide enhanced programs for language learners (Crandall 1994, Darling-Hammond 1994, Holmes Group 1986).

Third, there is a growing recognition that teachers' prior learning experiences (what Lortie [1975] refers to as "the apprenticeship of observation") play a powerful role in shaping their views of effective teaching and learning and their teaching practices. These preconceptions are remarkably resistant to change unless awareness of that prior learning is developed in the teacher education program and opportunities for practical experiences and conscious reflection upon those experiences are provided throughout the program (Freeman 1991; 1996, Freeman and Richards 1996, Johnson 1994, Kennedy 1987, Richards and Lockhart 1994). Similarly, one can expect that the way teacher educators were taught will be replicated in their teacher education programs unless conscious reflection upon teacher-education practice also takes place. Self-observation and reflection on practice can help teachers move from a philosophy of teaching and learning developed during their 16 or so years as a learner to a philosophy of teaching consistent with their emerging understandings of the language learning and teaching processes (what Freeman has referred to as InterTeaching, analogous to a language learner's development of interlanguage).

Fourth, there is a growing concern that teaching be viewed as a profession (similar to medicine or law) with respect for the role of teachers in developing theory and directing their own professional development through collaborative observation, teacher research and inquiry, and sustained inservice programs, rather than the typical short-term workshop or training program (Crandall 1993; 1994; 1996, Darling Hammond 1994, The Holmes Group 1986). Candlin and Widdowson, in their introduction to each volume of their series, *Language teaching: A scheme for teacher education*, sum up this trend in the following way: "If language teaching is to be a genuinely professional enterprise, it requires continual experimentation and evaluation on the part of practitioners whereby, in seeking to be more effective in their pedagogy, they provide at the same time—and as a corollary—for their own continuing education." Freeman (in Freeman and Richards 1996) argues that one function of inservice training for teachers is to enable them to be "bilingual," that is, to rename what they have been previously doing in light of what they are learning in their training, and by so doing, to function bilingually, adding professional language to the local language they use in their schools.

CONCEPTIONS OF LANGUAGE TEACHING AND MODELS OF LANGUAGE TEACHER EDUCATION

Traditional language teacher education has involved a delicate balancing act between education and training. The former addresses the development of language knowledge and language teaching and learning. The latter emphasizes the development of skills to apply this knowledge in the practice of language teaching, with a limited opportunity to observe and practice that theory in actual classrooms or simulated contexts such as microteaching (Crandall 1998). Those involved in preparing prospective language teachers refer to themselves as either teacher trainers or teacher educators. Widdowson (1997) describes teacher training as solution-oriented, with the "...implication that teachers are to be given specific instruction in practical techniques to cope with predictable events..," while teacher education is problem-oriented, with the implication of "...a broader intellectual awareness of theoretical principles underlying particular practices" (1997:121). In both orientations, the prospective or experienced teacher is viewed as a passive recipient of transmitted knowledge; omitted is any understanding of the role that language teachers play in their own development, which teacher research has begun to demonstrate as being of considerable importance (Edge and Richards 1993, Woodward 1991). Teacher development is a life-long process of growth which may involve collaborative and/or autonomous learning, but the important distinction is that teachers are engaged in the process and they actively reflect on their practices. According to Wallace (1991), "The distinction is that training or education is something that can be presented or managed by others; whereas development is something that can be done only by and for oneself" (p.3).

Wallace (1991) identifies three major models of language teacher education: 1) a craft or apprenticeship model by which less experienced teachers learn through observing those with more experience; 2) an applied science or theory-to-practice model by which knowledge is learned from experts and then applied in real-world contexts; and 3) a reflective model by which teachers reflect upon, evaluate, and adapt their own practice. These three models broadly correspond to the three views of teaching identified by Freeman (1991; 1996): 1) teaching as doing (a behavioral model emphasizing what teachers do and encouraging a skills or craft model of teacher education); 2) teaching as thinking and doing (a cognitive model emphasizing what teachers know and how they do it, encouraging both theory and skills development and craft and applied science models of teacher education); and 3) teaching as knowing what to do (an interpretivist view emphasizing why teachers do what they do in different contexts, encouraging the addition of reflection and the development of frameworks of interpretation to theory and skill development in teacher education). Wallace's three models of language teacher education are likely to be needed in all teacher development, but in different degrees, depending upon teacher experience and understanding. However, neither traditional education nor training are sufficient; also needed are opportunities for teachers to reflect upon their beliefs and practices and to construct and reconstruct their personal theories of language teaching and learning (Bailey 1992, Flowerdew, *et al.* 1992, Freeman and Richards 1996, Sachs, *et al.* 1996). "Teaching depends upon the application of appropriate theory, the development of careful instructional designs and strategies, and the study of what actually happens in the classroom" (Richards 1990:vii).

FROM METHODS TO METHODOLOGY AND THE IMPORTANCE OF CONTEXT

The core of traditional language teacher education has long been the methods course, a course which presents the theoretical rationale and practical implications of language teaching approaches, methods, procedures, and techniques (Anthony 1963, Blair 1982, Celce-Murcia 1991, Larsen-Freeman 1986, Oller 1993, Oller and Richard-Amato 1983, Richards and Rodgers 1982; 1986, Rivers 1981, Stevick 1980). Methods courses often discuss the rationale for, and instructional practices reflected in "innovative" methods (e.g., Silent Way, Community Language Learning, Natural Approach, Content-based Language Instruction) as well as "traditional" ones (Grammar-Translation, Audio-Lingual, Communicative), and they often combine this discussion with specific attention to techniques for teaching the four skills (listening, speaking, reading, and writing). Sometimes specific courses in oral or written skills are provided, as are courses in assessment and evaluation.

While courses in language teaching methods are still central to language teacher education, there is growing concern that they not be taught in prescriptivist terms, as recipes or cookbooks for effective teaching. Rather, they need to investigate the range of instructional options language teachers have available in their repertoires and, through case studies, interviews, or introspection, examine the kinds of decisions teachers make in planning and carrying out instruction (Richards 1990, Roberts 1998, Stevick 1998, William and Burden 1997). The shift from methods to methodology is consonant with constructivist theories of learning—a shift away from a top-down approach to methods as "products" for teachers to learn and "match" and toward a bottom-up approach to methodology as reflections on experiences. The shift involves prospective teachers in "...exploring the nature of effective teaching and learning, and discovering the strategies used by successful teachers and learners in the classroom" (Richards 1990:vii).

While few language teacher educators believed that the role of the traditional methods course was to make future teachers into "methods" teachers (cf. "methods actors"), the counter view, that prospective teachers should pick and choose from among the techniques described in an "eclectic approach," conveyed little coherence. Several recent core texts for methodology courses (Brown 1994, Nunan 1991; 1999, Omaggio Hadley 1993) are more cognizant of the role of context and the need to engage prospective and experienced teachers in analyzing their own theories of teaching and learning as they practice, discuss, and reflect upon instructional techniques (Graves 2000, Hartman 1998, Nunan and Lamb 1996). Collections of "what works" or "new ways" of teaching or educating teachers (e.g., Freeman and Cornwell 1993) continue to provide teachers with practical options, but analysis and evaluation of teaching and learning strategies that teachers use in a variety of contexts help bring coherence to the process. Focusing on teachers—their beliefs about teaching, learning, or classroom interaction—can help balance more top-down, product-oriented conceptions of language teaching, with more nuanced, bottom-up, process-oriented descriptions of specific language teaching events. Studies of teachers, either undertaken by teachers themselves or in collaboration with researchers (Shulman 1992), can help illuminate the processes by which language teachers plan and make decisions about their teaching (Woods 1996). Central to these studies is the need to examine underlying teacher beliefs and teacher thinking.

1. Teacher cognition and beliefs

Traditional teacher education has largely ignored the substantial set of beliefs about teaching, learning, teacher-student roles, and the like which teacher candidates bring to their program from their experiences as students and language learners. Teachers do not engage in mere implementation of routinized procedures, but are constantly engaged in thinking, problem-solving, and decision-making. While content knowledge and pedagogical content knowledge remain important underpinnings of language teacher education, also needed are opportunities for prospective teachers to become aware of their own beliefs about effective teaching and learning, and they need opportunities to acquire the ways of thinking (general strategies, personal orientation, and habits of mind) that characterize being a member of the language teaching community. Case studies and teacher narratives, teaching videos, and teacher journals offer windows into that thinking (Kennedy 1987, Richards and Lockhart 1994, Woods 1996).

Teacher cognition is "situated" in practice (Lave 1988); thus, it is important to consider the effects of context upon teacher decision-making and teaching and learning. Traditional language teacher education programs have attempted to capture some of the diversity of language teaching situations in broad terms through courses and texts which look at learners with respect to common patterns of variation: different ages (teaching young children or adults), different levels of proficiency (teaching beginners or advanced learners), different purposes for learning (academic, professional, or "general"), and different contexts (second or foreign language; intensive or occasional). But these attempts are not likely to provide sufficient preparation for the heterogeneity of learners or contexts that teachers actually encounter. Fanselow (1987; 1992), Head and Taylor (1997), and others offer a number of activities to make teachers' underlying beliefs more explicit and to encourage the development of alternative perspectives.

Studies of teachers and teaching reveal the number of decisions which teachers make, often with competing demands and not much time to think back to principles or applications derived from teacher education programs (Burns 1995, Freeman and Richards 1996, Kleinfield 1992). Woods (1996), in the first major study of teacher cognition in language teaching, describes how teachers rely upon experience and call into play their beliefs, assumptions, and knowledge in that decision-making. Richards (1996) identifies eight maxims or principles derived from experience which teachers use to explain the decisions they make during teaching. Often tacit, these maxims need to be made explicit if teachers are to consider new techniques or changes in practices.

2. The role of reflection

What is often missing from traditional language teacher education is recognition of the role that the teacher plays in generating knowledge through teaching experience and reflection (conscious recollection and evaluation of that experience; Bartlett 1990, Freeman and Richards 1993, Wallace 1991). As Bruner (1986; 1990) explains, universities have traditionally focused on scientific knowledge which is abstract, decontextualized, and impersonal, but teachers also need access to narrative ways of knowing which relate theory to specific practices in concrete, contextualized, and personal ways. In focusing on "how," language teacher education has ignored the important "what" and "why" questions which can only be answered by teacher reflection and research. Bartlett (1990) suggests a cycle (similar to action-research cycles) moving from observation, to interpretation, introspection and questioning, to consideration of alternatives, and then to adaptation of instruction. Wallace (1991) also provides a scheme by which teachers can recall their practice and engage in critical reflection Fanselow (1987) suggests that teachers "break rules" and then observe and reflect upon the consequences. Reflection on experience provides a means for prospective and experienced teachers to develop more informed practice, making tacit beliefs and practical knowledge explicit, articulating what teachers know and leading to new ways of knowing and teaching. Long ignored, teacher inquiry and reflection are now viewed as important to the development of language teaching theory and appropriate language teacher education.

3. Teacher narratives and case studies

Many ways of tapping into teachers' knowledge and helping teachers to make explicit their own beliefs about teaching have been proposed, including analyses of teacher logs, diaries, or journals; audio or video recordings of teaching; interviews; and teacher narratives or case studies of teacher practice (Kleinfield 1992). Narratives (stories, cases, lessons, anecdotes, and extended examples), long a part of teacher education, were dismissed as "practitioner lore" by scientific positivism, and have only recently been brought back into teacher education (Shulman 1992, Wideen, *et al.* 1998). Teaching case studies and stories (like those used in the medical, legal, or business education) provide a means of bridging theory and practice and demonstrating the complexity of teaching as a profession. They provide contextualized portraits of the many factors which influence teacher decision making and behavior in the classroom

Teacher narratives, or "stories" that teachers tell about their classroom experiences, convey the daily experiences of teachers and the ways in which they try to make sense of these experiences through talking or writing about them (Bailey and Nunan 1996, Casanave and Schecter 1997, Hartman 1998, Plaister 1993, Richards 1998). Teachers avoid abstract theoretical statements in talking with each other about their work because these lack connection to classroom experience. Stories help teachers understand students; they address the dilemmas of teaching and the competing roles that teachers carry out; and they provide professional development through reflection on practice. Narratives represent a primary way in which teachers organize and understand the complexities of their profession, involving competing demands, constraints, policies, and power relations. In working with case studies, prospective and experienced teachers become actively involved in the kinds of decision-making they face in their language teaching (Plaister 1993). Case studies also offer a way to help teacher educators avoid the imposition of culturally inappropriate teaching philosophies (Bax 1995a; 1995b).

4. The role of practical experience

The growing respect for the situated knowledge of the teacher, the recognition of the teacher as central in the teaching and learning process, and the crucial roles of the teacher as program and materials developer, needs analyst, decision-maker, problem-solver, and researcher of his or her own classroom (Richards 1990), has led to a call for teacher preparation programs to create opportunities for prospective teachers to access this knowledge and test theories and principles with actual practice. Practica (practical experiences such as observations, internships, apprenticeships, student teaching, or other teaching practice) have long been a part of most language teacher education programs. Richards and Crookes (1988) found that 75 percent of the language teacher education programs they reviewed included a practicum experience, ranging from observing experienced teachers or peers, being observed by or conferencing with supervising or mentor teachers, participating in peer or microteaching, or being responsible for classroom instruction. However, these experiences are often too few, too late, and not sufficiently focused on the realities of the classroom, the program, or the school (Crandall 1996). A number of language teacher educators (Crandall 1994, Johnson 1996b, Richards 1990) have called for more extensive and intensive practical experiences to be integrated throughout the teacher education program, providing prospective teachers with greater opportunities to link theory with practice and to receive support and learn from experienced teachers, while also offering experienced teachers an opportunity to learn from their new counterparts (Stoynoff 1999). Within general teacher education, prospective teachers spend more time in real teaching situations than is often the case in language teacher preparation programs, especially those housed outside of education departments. Partnerships between university-based teacher education departments and schools offer prospective and experienced teachers opportunities for engaging in collaborative research and teaching, while also benefitting the language learners in the classroom. (See Crandall 1994; 1995 for a description of a professional development center approach which engages prospective and experienced language teachers in research, program planning, curriculum development, and teaching to benefit secondary school immigrant students as well as improve teacher education and development.)

Observation of mentor teachers or peers and self-observation through video recordings, accompanied by reflective activities such as journal writing and feedback or discussion sessions, are especially important for language teacher preparation and continuing teacher development (Crandall 1994, Fanselow 1987). Unfortunately, because observation is characteristically used in teacher supervision and evaluation, the self-knowledge it can provide has too often been ignored. A number of observation schemes and instruments have been developed that enable teachers and researchers to focus attention on specific aspects of classroom interaction, management, or instruction, and construct or reconstruct understandings of language teaching and learning.

Teacher-education programs can also provide practical experiences that encourage prospective teachers to continue their professional development after leaving the program. These experiences help prepare them for a variety of professional activities: writing for publication, developing proposals for conference presentations or grant funding, or working on public speaking and professional presentations (Crandall 1996).

5. The role of research

Classroom research, research that is carried out in the second or foreign language classroom to answer questions about teaching and learning, plays an increasingly important role in both initial teacher preparation and ongoing teacher development. This research can focus on teachers (e.g., questioning strategies, teacher decision-making, error correction, or teacher modifications); learners (e.g., learning styles and strategies, learner interaction, affective variables, or language output from specific tasks); or the interaction between teachers and learners (Burns 1995, Nunan 1989, van Lier 1988). Research on language acquisition and learning was traditionally conducted by university researchers (sometimes in collaboration with language teachers) and reflected their research traditions, using experimental, ethnographic, discourse, or interactional analyses (Chaudron 1988), often with a goal of identifying "best practices" in language teaching or learning. Studies of teachers attempting to implement these best practices reveal that teachers adapt them substantially to fit their specific teaching contexts. This adaptation process has led to the addition of action or teacher research grounded in the specifics of individual teacher contexts. Allwright and Bailey (1991) offer a number of suggestions for small-scale and large-scale research and provide guidance on conducting research and analyzing findings. Such research can be undertaken collaboratively by teacher educators/researchers and teachers or individually by teachers researching their own classrooms (Crandall 1994; 1995). Research undertaken by teachers and focused on observation, analysis, and potential changes of one's own teaching represents one means by which teachers can reconsider their assumptions and practices and enhance teacher professionalism. Often, this research is most successful when teachers collaborate in the research process or engage in inquiry or study groups which meet periodically to discuss findings; otherwise, the daily responsibilities of teaching may take precedence. The publication of the results of teacher research in journals, stories, or case studies can also provide opportunities for other teachers to explore changes in their own practice as well.

ASSESSMENT IN LANGUAGE TEACHER EDUCATION

Congruent with increased emphasis on performance assessment in language teaching is the increasing focus on performance assessment of prospective and experienced teachers, especially in new teacher-evaluation schemes resulting from the standards movement (Johnson 1996b). These performance assessments may include audio- or videotapes of classroom teaching; examples of student work;

lesson plans, curriculum guides, or syllabi; entries from a teaching log or journal; statements of a personal (evolving) philosophy of teaching; or simulated performances such as microteaching, role plays, or interviews. Frequently, these documentations of performance are combined into a teaching portfolio (along with a curriculum vita, transcripts, letters of reference, teaching evaluations, and brief annotations or reflections on the significance of the contents of the portfolio), providing concrete evidence of teacher capability and ongoing development. In some teacher education programs, the teaching portfolio serves as documentation of the student teaching experience; in others, it is integrated into the entire program and serves as one of the final evaluation criteria.

NATIVE- AND NON-NATIVE-SPEAKING PROFESSIONALS IN SECOND AND FOREIGN LANGUAGE CONTEXTS

Another concern in language teacher education which is receiving a great deal of attention in both the foreign and second language teaching communities is the role of the native speaker (Kramsch 1997). Because of the globalization of English, the growing prominence of World Englishes, and the increasing need for English teachers around the world, the issues of appropriate competencies, expectations, and roles for native- and non-native-speaking teachers have received frequent discussion (Braine 1998, Cook 1999, Medgyes 1992; 1994). Determining who is a "native speaker" is not quite so simple as previously imagined, and the linkage between native-speaking proficiency and professional competence is also often misconstrued (when teachers are hired not because of their preparation, but because they are "native speakers"). Recently, a number of researchers and language-teacher educators have called for the rejection of near native-speaker proficiency as a model for language education (Cook 1999) and have pointed out the advantages of non-native speakers. Teachers who share the same linguistic and cultural experiences with their students can provide a good model for them, anticipating problems and sharing strategies they have used in their own language learning (Kahmi-Stein, *et al.* 1999, Medgyes 1994).

Research has also documented the concerns that non-native-speaking teacher candidates have in teaching in a context in which most of the teachers are native speakers (Kahmi-Stein, *et al.* 1999, Polio and Wilson-Duffy 1998), including a lack of self-confidence about target-language proficiency, perceived bias in favor of native speakers in hiring, and, when engaged in teacher education outside their own country, a lack of role models and voice in their own profession. Ways to address these issues include pairing non-native and native-speaking students in field experiences and other practica; assigning non-native-speaking teacher candidates to non-native-speaking mentor teachers; integrating issues related to non-native speakers throughout the curriculum; and addressing language-proficiency needs. Similarly, language teacher education programs need to address foreign-language contexts, especially the more problematic situations involving large classes, limited materials and resources, and unfamiliar educational policies and teaching practices (Braine 1998).

SOME SPECIAL CONSIDERATIONS FOR EXPERIENCED TEACHERS

While much of the above discussion has focused more on inexperienced teachers and teacher preparation, as well as inservice teacher education and development, there are a number of studies which address the specific issue of teacher development with experienced teachers. These studies include the importance of shared responsibility for the design and delivery of inservice programs, sustained time for learning and reflection, and opportunities for feedback and reflection (Bax 1995a; 1995b, Darling-Hammond 1994, Hayes 1995). In discussing an inservice teacher-training program in Thailand, Hayes (1995) argues that sessions should be task-based, classroom-centered, and practical, focusing not only on the application of theory to practice, but also including awareness-raising sessions, with shared responsibility in both the design and the implementation of the program. Teachers should also have opportunities to practice innovations through microteaching, peer teaching, and poster sessions before returning to their classrooms and, where possible, engage in follow-up sessions.

NOTES

1. Reviewing any field requires difficult decisions, but this is especially true of language teacher education. The last decade has witnessed the publication of hundreds of books and articles in this field. In choosing among these, I have drawn more from the ESL/EFL teacher-education resources, especially those written about the United States context, because I know that literature best. However, much of what is written about English language teacher education may be applicable to other language teacher education if issues of cultural appropriateness or cultural appropriation are taken into consideration.

ANNOTATED BIBLIOGRAPHY

[The large number of texts and articles published in the last ten years on language teacher education make it impossible to be comprehensive. In the references, I have explicitly eliminated discussion of texts related to teaching specific language skills (listening, speaking, reading, or writing) or specific language systems (pronunciation, grammar, vocabulary) except as these are discussed in more general methods texts. I have also not included texts focused specifically on a particular method or approach or the use of corpora, technology, or other new resources. It was also necessary to eliminate texts focused on specific learners (children or adult, beginners or advanced, school or university, or students with special needs such as learning disabilities). The fact that hundreds of these resources have been published in the last ten years is one demonstration of the increasing professionalism of the language teacher education field.]

Bailey, K. M. and D. Nunan (eds.) 1996. *Voices from the language classroom.* Cambridge: Cambridge University Press.

This collection of stories told by language teachers and teacher educators in a wide range of contexts (ESL classes in Pakistan, KwaZulu high school classrooms in South Africa, dual-language classrooms in Hungary, junior high classes in the US, and bilingual classrooms in Peru) is intended for prospective and experienced teachers, teacher educators, and researchers in second and foreign language education. Using data from observational field notes, teachers' and learners' journals, interviews, stimulated recall protocols, and lesson plans and transcripts, the stories provide an opportunity to listen to teachers talk about their understandings of teaching and learning, and the interpretations they make of their own experiences in thinking, problem-solving, and decision-making in a variety of contexts. Issues such as class size, student anxiety in class participation, fear of failure in a writing classroom, student and teacher reactions to changes in curriculum, and the effects of different pedagogies or program structures are all explored.

Candlin, C. N. and H. G. Widdowson (series eds.) *Language teaching: A scheme for teacher education*. Oxford: Oxford University Press.

Designed to involve language teachers in their own professional development through "critical appraisal of ideas and the informed application of these ideas in their own classrooms" (introduction to the series), this integrated series is organized in three sub-themes of inquiry and practice in language teaching and learning: 1) language knowledge, dealing with linguistic description (pronunciation, vocabulary, grammar, and discourse); 2) modes of behavior, applying that knowledge in the teaching of the four language skills (speaking, listening, reading, and writing); and 3) modes of action, operationalizing knowledge and behavior in language teaching (syllabus design, language-course content, methodology, and evaluation). Each volume is organized into three sections: 1) explanation (theoretical background); 2) demonstration (the application of that theory), and 3) exploration (small-scale classroom-centered research activities for teachers to undertake). Titles in the series include:

Anderson, A. & T. Lynch. *Listening*.
Batstone, R. *Grammar*.
Bygate, M. *Speaking*.
Cook, G. *Discourse*.

Dalton, C. & B. Seidlhofer. *Pronunciation.*
McCarthy, M. *Vocabulary.*
Nunan, D. *Syllabus design.*
Rea-Dickins, P. & K. Germaine. *Evaluation.*
Tribble, C. *Writing.*
Wallace, C. *Reading.*
Wright, T. *Roles of teachers and learners.*

Freeman, D. (series ed.) *TeacherSource series.* Boston: Heinle and Heinle.

This series positions the teacher's voice at the center of language-teacher development, focusing on the teacher's point of view in coming to understand aspects of teaching and learning. Each volume consists of three strands: 1) teachers' voices, where practicing language teachers in various settings talk about their experiences with the topic; 2) frameworks, which lay out key concepts and issues related to the topic; and 3) investigations, which provide activities to engage readers to relate the topic to their teaching contexts. Titles in the series include:

Anderson, N. *Exploring second language reading: Issues and strategies.*
Bailey, K. *Learning about language assessment: Dilemmas, decisions, and directions.*
Campbell, C. *Teaching second-language writing: Interacting with text.*
Becker, H. *Teaching ESL K-12: Views from the language classroom.*
Freeman, D. *Doing teacher research: From inquiry to understanding.*
Graves, K. *Designing language courses: A guide for teachers.*
Irujo, S. *Teaching bilingual children: Beliefs and behaviors.*
Johnson, K. E. *Understanding language teaching: Reasoning in action.*
Larsen-Freeman, D. *Teaching language: From grammar to grammaring.*
Moran, P. *Teaching culture: Perspectives in practice.*
Scovel, T. *Learning new languages: A guide to second language acquisition.*
Stevick, E. *Working with teaching methods: What's at stake?*
Johnson, K. E. *Teachers understanding teaching.* [CD-ROM]

Freeman, D. and K. E. Johnson (eds.) 1998a. *Research and practice in English language teacher education.* [Special issue of *TESOL Quarterly*. 32.3.]

Perhaps no other volume in the last decade better portrays the major concerns in language teacher education than this special issue of the *TESOL Quarterly*. Following a lead article by the editors on "reconceptualizing the knowledge-base of language teacher education, subsequent articles explore issues of research, practice (especially "best practice"), and collaboration in teacher education." The issue concludes with a number of thematic reviews of teacher education books and series.

Freeman, D. and J. C. Richards. 1993. Conceptions of teaching and the education of second language teachers. *TESOL Quarterly*. 27.193–216.

In their attempt to answer the question: "What is an appropriate theory of effective language teaching?" the authors analyze a range of ESL/EFL approaches and methodologies, using Zahorik's (1986) tripartite division of teaching conceptions: 1) science/research conceptions, which operationalize learning principles, follow a tested model, or base their notion of what effective teachers do on empirical studies; 2) theory/ philosophy conceptions, which rely on rational or values-based explanations, rather than empirical evidence; and 3) art or craft conceptions, which take an eclectic approach to both methodology and techniques and place more emphasis on the teacher than on the methodology. The authors point out that no teacher teaches according to just one of these; no one conception of teaching is superior to another (myth of supremacy); nor does a teacher consciously select a teaching conception at some point in training (myth of correct choice). There is also no evidence that teachers go through stages of professional development, accepting and then rejecting one conception (for example, science/research) only to embrace another. Their analysis of teacher training programs suggests that teacher educators take one of three positions with regard to these conceptions of teaching: 1) noncompatibility, accepting one and rejecting others; 2) eclecticism, treating all conceptions as equal and encouraging teachers to choose among them; and 3) developmental, viewing different conceptions as appropriate at different stages of professional development.

Freeman, D. and J. C. Richards (eds.) 1996. *Teacher learning in language teaching*. Cambridge: Cambridge University Press.

"In order to better understand language teaching, we need to know more about language teachers...what they know about language teaching, how they think about classroom practice, and how that knowledge and those thinking processes are learned through formal teacher education and informal experience on the job" (p. 1). The 15 studies in this collection offer insights into the thinking and experiences of teachers and their responses to training and teaching from three perspectives: the usefulness of preservice training, the importance of learning in the practice of teaching (teacher decision-making during teaching), and the role of teacher education in teaching practices.

Hartman, D. K. (ed.) 1998. *Stories teachers tell: Reflecting on professional practice*. Lincolnwood, IL: National Textbook Co.

This collection of presentations from the 1998 Northeast Conference on Foreign Languages is the first to be authored by classroom teachers and presented in narrative form. These 40 "professional stories," grouped into "beginnings," "evolution," "revelation," and "extinction." are written by and for novice or experienced foreign- and heritage-language teachers teaching in a wide range of kindergarten through university contexts. The contributors spent a weekend together in a writers workshop where they discussed, wrote, rewrote, and edited their contributions together. One of the most interesting stories for teacher educators is that of a student teacher whose creativity and confidence in the Spanish classroom is nearly destroyed by one supervising teacher, only to re-emerge when the student is assigned to another. G. Richard Tucker, in his review of the stories at the end of the collection, identifies "...strong correspondences between classroom practice and current language education theory ...," with teachers incorporating "...exemplary practices into their classrooms on a continual basis" (218–219). But he also notes a discordant discrepancy between how teachers present themselves in these stories ("anxious, creative, empathetic, ingenious, and sensitive") and the exemplary ways ("highly focused, intellectually confident, productive, and task-oriented") in which language researchers, policy makers, and administrators present teachers (220).

Head, K. and P. Taylor. 1997. *Readings in teacher development.* Oxford: Heinemann.

Written by two language teachers and teacher trainers with extensive experience in English language teacher development, this collection of readings and activities is designed to inspire and help teachers in their own development. The book begins by defining teacher development and then explores ways in which teachers can learn about themselves in relation to the learners in their classrooms and their interactions with colleagues. The final chapters focus on personal well-being, including coping with challenges and potential burnout, managing change, and assessing one's own progress. The book draws upon a wide range of sources (general educational theory and practice, psychology, and group dynamics, as well as language teaching and teacher development) in the brief text excerpts; it then provides a "jigsaw" of activities which can be undertaken alone or with others to promote greater self-awareness, confidence, willingness to experiment and change, and personal growth as a teacher.

Lee, J. L. and B.VanPatten (series eds.) *The McGraw-Hill foreign language professional series: Directions in second language learning,* and *Perspectives on theory and research.* New York: McGraw Hill.

These two related series of texts for second and foreign language teachers, teacher educators, and researchers explore the relationship between second language acquisition research and second and foreign language teaching. The "Directions" series focuses on classroom instruction and management and is intended for teacher educators and teachers, while the

"Perspectives" series is primarily for researchers of second language acquisition and teaching. Titles in the two series include:

Bardovi Harlig, K. & B. Hartford (eds.) *Beyond methods: Components of second language teacher education.*
Lee, J. F. & B. VanPatten. *Making communicative language teaching happen.*
Musumeci, D. *Breaking tradition: An exploration of the historical relationship between theory and practice in second language teaching.*
Sauvignon, S. J. *Communicative competence: Theory and classroom practice.*

Richards, J. C. 1990. *The language teaching matrix.* Cambridge: Cambridge University Press.

With a goal of engaging "...teachers and teachers-in-training, as well as teacher educators, in the investigation of classroom teaching and learning ..." (ix), this collection introduces the "matrix," Richards' metaphor for an "...interactive and multidimensional view of language teaching...," consisting of a number of factors, including teachers, learners, the curriculum, methodology, and materials. Chapters address curriculum development, the design of instructional materials, and particular issues in the teaching of listening comprehension, spoken conversation, reading, writing, and content-based instruction (the latter written with Daniel Hurley). Throughout, the emphasis is upon a bottom-up description of the processes of teaching and learning (methodology), rather than a top-down approach to methods or products, consistent with the approach that Richards outlines in the second chapter, "Beyond methods." Much of what Richards discusses in his last chapter, on directions for language teacher education, is occurring today, including a shift from "training" to "education" perspectives; an emphasis on research in both preservice and inservice development; an inquiry, discovery-oriented, and reflective approach to teaching and learning; and an increased dependence on educational research and theory (especially curriculum and instruction) and reduced dependence on linguistics and language theory in language-teacher development.

Richards, J. C. and D. Nunan (eds.) 1990. *Second language teacher education.* Cambridge: Cambridge University Press.

A goal of this collection is to help prospective teachers develop critical decision-making skills and self-awareness as a teacher. The first chapter, by Richards, discusses the need for a "theory of effective teaching." He considers both a micro approach, looking at individual teacher behaviors such as questioning, pacing, or wait time, and a more macro or holistic approach, looking at teacher-student interaction in the classroom, including turn-taking, task organization, and classroom management. Also included are chapters by Nunan on "Action research in the classroom" and by Bartlett on "Teacher development through reflective teaching," one of the earliest discussions of the place of reflective teaching in ESL/EFL teacher education.

Underhill, A. (series ed.) *The teacher development series*. Oxford: Heinemann.

Intended for teachers, trainers, and academic managers, this series is focused not only on "...subject matter and teaching methods ...," but also on the "...people who are working with the subject and using the methods." The goal of the series is to widen the perspective of language teaching and to encourage teachers to become students of their own learning. Titles in the series include:

Bowen, T. & J. Marks. *Inside teaching*.
Head, K. & P. Taylor. *Readings in teacher development*.
Impey, G. & A. Underhill. *The ELT managers' handbook*.
Scrivener, J. *Learning teaching*.
Underhill, A. *Sound foundations*.

Wallace, M. J. 1991. *Training foreign language teachers: A reflective approach*. Cambridge: Cambridge University Press.

After discussing two traditional models of language teacher education (craft and applied science), Wallace focuses on a third, involving reflection, which he develops throughout the book. He describes ways for teachers to recall their experiences and engage in reflection, suggesting the use of a number of media (audio, video, teacher logs), as well as approaches to recording, coding, and interpreting the findings.

William, M. and R. L. Burden. 1997. *Psychology for language teachers*. Cambridge: Cambridge University Press.

This educational psychology text for language teachers reviews major developments in psychological theories and discusses their relevance for language teaching and learning. Beginning with a review of behaviorism, humanism, and cognitivism, the authors then focus on integrating a social-interactionist perspective with a social-constructivist approach to learning, discussing in detail Feurestein's concept of mediation, Vygotsky's zone of proximal development, the role of attribution theory to individual learner variables, learner training, and the importance of context (both outside and inside the classroom) on teaching and learning. A final chapter reviews 10 basic principles for language teachers which emerge from the previous discussion.

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LANGUAGE FOR SPECIFIC PURPOSES

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LANGUAGES FOR SPECIFIC PURPOSES

John M. Swales

SOME BRIEF HISTORICAL PERSPECTIVE

Thirty-five years ago, three leading British linguists published a landmark volume entitled *The linguistic sciences and language teaching* (Halliday, McIntosh and Strevens 1964). The careful wording of the title of this book was something of a clarion call; in effect, the authors promised to usher in a Brave New World of a stronger descriptive base for pedagogical materials. As far as Language for Special Purposes (LSP) is concerned, the key passage (which is well worth revisiting after all this time) is the following:

> Only the merest fraction of investigation has yet been carried out into just what parts of a conventional course in English are needed by, let us say, power station engineers in India, or police inspectors in Nigeria; even less is known about precisely what extra specialized material is required.
>
> This is one of the tasks for which linguistics must be called in. Every one of these specialized needs requires, before it can be met by appropriate teaching materials, detailed studies of restricted languages and special registers carried out on the basis of large samples of the language used by the particular persons concerned (1964:189–190).

This forthrightly-expressed agenda proved very attractive to most of the small band of LSP practitioners working in the 1960s as well as to many of the increasing numbers of others who have become involved in the LSP movement in each succeeding decade. The reasons for this attractiveness are not hard to find. The research would be descriptive (with no "literary" stylistic criticisms of the target discourses); it would deal with "normal" discourse (and not that provided by famous figures in the respective fields); it would be synchronic (with no need to look back at shaping historical forces); it would be basically textual or transcriptal (with little attempt to investigate such matters as authorial motives for linguistic choices); and it would rely on functional grammar, as primarily developed by

Halliday, and also make use of some version of the "neo-Firthian" model of contextual factors affecting language choices.

In retrospect, we can see that the great appeal of this approach lay in the fact that it seemed eminently *manageable* to early LSP practitioners, who were often working in underprivileged environments and who were also having to administer programs, develop teaching materials, and do a fair amount of teaching. First, the 1964 "manifesto" offered a simple relationship between linguistic analysis and pedagogic materials. Second, there was no strong emphasis on the need for practitioners to have any of the following types of expertise: Expert content knowledge of the fields or professions they were trying to serve; real understanding of the rhetorical evolution of the discourses central to those fields or professions; or advanced anthropological training in "fly on the wall" ethnography. Third, the ways and means of studying registers and special languages were often taught in graduate courses and were familiar territory for LSP practitioners (although less so in the United States). The early LSP practitioners were thus well equipped to carry out relatively "thin" descriptions of their target discourses. What they principally lacked was a perception of discourse itself and of the means for analyzing and exploiting it—*lacunae* that were largely rectified by the 1980s.

We can usefully view the thirty-five years of Languages for Specific Purposes since the publication of *The linguistic sciences and language teaching* as a response (even if often inadvertent) to this opening scenario. On the one hand, there has been a solid tradition of work that has continued this descriptive textual tradition, albeit with shifts in focus from language to discourse to genre, and perhaps now to activity theory (Russell 1997). For example, many of the articles in the leading journal *English for Specific Purposes* fall into this category, as do many LSP master's theses from many parts of the world, and as do two of the collections selected for the Annotated Bibliography of this review (Duszak 1997, Fortanet, *et al.* 1998).

On the other hand, all of these founding tenets have been challenged at one time or another. The challenge to a simplistic relationship between linguistic analysis and classroom activities has long been one of Widdowson's major contributions to ESP (e.g., Widdowson 1998), and perhaps it reached its fullest earlier expression in Hutchinson and Waters (1987). More recently, the debate about this relationship has re-emerged in the context of how to handle in class the new masses of linguistic data being produced by corpus linguistics (Partington 1998). The second issue (what should practitioners know) has also become more complex. Part of this issue simply derives from the massive amount of new information that is now available; for example, we now have several studies that can tell us much about the evolution of professional discourse—in economics (Gunnarson 1997a, Henderson, Dudley-Evans and Backhouse 1993), in physics (Bazerman 1988), and in the life and health sciences (Atkinson 1999a, Salager-Meyer 1997, Valle 1999). Further, new approaches to understanding professional discourse have been developed, ranging from "shadowing" individual professionals as they go about their work (Dudley-Evans and St John 1998); to investigations into textual biographies (Swales 1998); to deeper perceptions of text construction, reception, and evaluation (Prior 1998); to various kinds of study of workplace discourse (Gunnarson, Linell and Nordberg 1997); and on to ideological critiques (Huckin 1997). However, if understanding discourse is so complexly situated in all these potentially various ways, then LSP practitioners are today forced into some kind of informal cost-benefit analysis as they struggle to come to terms with how much they need to know *before* they can offer what they have learned to their students. In this climate of competing models, exhaustive explorations, growing internationalization, and an exploding literature, it is not altogether surprising that the *simplicity* of purely textual studies based on mid-sized corpora continues to have appeal, perhaps especially in studies that attempt to compare texts in English with those of another language (Connor 1996).

LSP: A PROFESSION, A DISCIPLINE, OR NEITHER?

ESP/LSP has a rather peculiar relationship with other branches of applied linguistics. Its closest connection is certainly with discourse analysis and pragmatics (including cross-cultural pragmatics); indeed, in some sense, it can be argued that in many ways LSP *is* the prime realization of applied discourse analysis. (And this is not to disregard comparable and important developments in business and technical communication in North America and in the training of translators in Europe.) It also has good connections with language assessment and communicative language teaching. On the other hand, it has very few points of contact with second language acquisition (SLA). Indeed, in this context it is probably not a chance event that last year's *ARAL 19* had an opening section entitled "Second Language Acquisition" and a distinct second one entitled "Language Use in Professional Contexts." These two intellectual worlds thus continue to be socially constructed poles apart, perhaps because SLA continues to focus on grammar and its acquisition by young and often beginning learners. However, if these kinds of field-imposed restrictions are a cause of regret to the LSP movement, it is also true that LSP has been insufficiently concerned with how and how well its students acquire or do not acquire the communicative and literacy skills that they need. One thin strand of inquiry that has attempted to bridge this gap has been investigations into the transfer of academic skills (Johns 1997), and whether this learning is primarily articulated through content, through knowledge of a particular discourse domain (Douglas and Selinker 1994, Whyte 1995), or through the "formal" knowledge of how different genres are co-constructed and internally articulated. More work in this area would be welcome.

A major consequence of this picture is that LSP has a highly variable status as both a discipline and a profession in different parts of the world. The disjunction between ESP/LSP and language acquisition, basic FL methodology, psycholinguistics, and sociolinguistics has in the United States left very little space in graduate programs for ESP work. Apart from some individual efforts to change this situation, such as those by Peter Master and Denise Murray at San Jose State, the lack of opportunity for professional preparation has had deleterious effects on research and program quality. Elsewhere, the situation is much rosier because of the emergence of Departments of Applied Language Studies (or close terminological cousins), especially in places like Australia, Brazil, Britain, Hong Kong, and Scandinavia. Although these units are not always primarily interested in ESP/LSP, they tend to be favorably disposed to its aspirations. Finland, for example, in 1999 launched a nationally-funded Ph.D. program in applied language studies to be centered at the University of Jyväskylä.

The ESL/FL field as a whole, and as seen internationally, is known for having "a long tail." In other words, there are very few senior (professorial) positions but many lecturers, adjuncts, and part-timers. This situation is also largely true of ESP/LSP where traditional forces in language, literature, and linguistics departments have operated to preserve senior posts for established areas of scholarship, and where many LSP practitioners have unstable careers as independent consultants. As a partial consequence of this, ESP/LSP has yet to establish itself as either a full profession or as clear sub-discipline in the language sciences. The import of this uncertain status for the potentially globalized language situation in the new century is hard to ascertain, but the lack of institutional structure will probably be seen as more of a deficit than will its more optimistic interpretation—entrepreneurial flexibility—be believed to be an asset.

LSP AND SCIENCE, MEDICINE, AND LAW

In the spirit of Bakhtin's work on intertextuality (Bakhtin 1986), which has been so influential in studies of academic and professional discourse, I can open this short section by referring interested readers to the comprehensive surveys of the following areas in *ARAL 19*: Atkinson (1999b) on language and science; Gibbons (1999) on language and the law; and Hyden and Mishler (1999) on language and medicine. In consequence, I will be mostly concerned here with some LSP amplification and some minor updating.

As Atkinson (1999b) reveals, there have been numerous rhetorical and linguistic accounts of the contemporary scientific style, especially as it is encoded in the research article—that master academic narrative of recent decades. Montgomery (1996) offers an elegant recent synopsis:

> Scientist or not, one hears the voice of univocity, unbroken statement, the single voice of the scientific style. But how achieved? How constructed? For the most part, through a series of grammatical and syntactic strategies that attempt to depersonalize, to objectify all premises, such that they seem to achieve the plane of ahistorical essence: "recent advances have shown..."; "Analyses were performed..."; "The data, therefore, indicate...". The narrative is driven by objects, whether these be phenomena, procedures, earlier studies, evidence, or whatever (1996:13).

Meanwhile we know from the classic early laboratory studies, from Berkenkotter and Huckin (1995), from Prior's (1998) case studies, and from *The mangle of practice* (Pickering 1995), that matters on the investigative ground are much more contingent, haphazard, and interpersonally complex. Although focus on such compressed and depersonalized accounts has concentrated for good reason on methods sections, Dressen and Swales (in press) explore the suppression of field experience in *introductions* to geology articles. They show that petrologists no longer offer any descriptions of their expeditions to inhospitable settings, which are now replaced by a part-genre usually called "Geological Setting." Expertise in the locale is communicated via a condensed, expert, and conventionalized description and interpretation of the site's geological record, which has thus come to function as surrogate for the silenced voice of geological authority. In effect, their findings nicely reflect Montgomery's observation that "the narrative is driven by objects, whether these be phenomena, procedures, earlier studies, evidence, or whatever" (Montgomery, op. cit.). As Huckin trenchantly observes, "those of us interested in the cultural aspects of genre study would do well...to include textual silence in the list of features to be analysed" (Huckin 1997:76). For LSP in its more applied aspects, there would seem to be an important lesson here. If our students need various kinds of help as they acculturate into their chosen scientific or technical cultures, then they need to see that contemporary specialized texts are distanced reconstructions of mangled experience. If they do not, they will tend to believe that published authors have, in comparison to their own messy and preliminary excursions, been blessed by some unlikely combination of skill, magic, or luck to get everything seemingly so exactly right. EAP teaching and support materials might therefore do better by giving more attention to false starts, abandoned leads, and various types of revision and correction.

Although Johns (1997), Dudley-Evans and St John (1998), and Atkinson (1999a) all do a creditable job in describing and explaining the rise of genre-based approaches, they all stop short of conceptualizing genres as more than independent entities. Doubtless, taking a genre as a separable class of texts was a sensible practice in the early days of the genre movement, but pioneering studies by Bazerman (1995) on patents and by Devitt (1991) on tax accountancy communications reveal how genres are networked and reticulated. It is not clear at the moment how best to characterize these relationships, whether any kind of single characterization will work, or whether possible answers lie more in theory or in empirical investigation. At one extreme there are linear orderings such as in patent law, whereby genre X is prerequisite for the instantiation of genre Y, and Y a necessary precursor for genre Z. Here, as Bazerman argues, we could indeed envision some *system* of genres. At the other end, in the academy, the relationships among conference presentation or poster, publication, and thesis or dissertation have no necessary chronological relationship, even though there may be orderings in the sub-systems of supporting but "occluded" genres:[1] A conference abstract is submitted, a committee reviews it, they find it acceptable and require a short summary for the program booklet, and the presentation event actually takes place. However, in academic situations in general, we might be better advised to think of genre relationships in terms of *sets*. While both of the above cases share a requirement for the selection of specific genres, still looser arrangements are possible in which, at many decision-points, communicative action can be realized by potentially different genres. For example, a request for an academic paper may be communicated by a departmental "reprint request" card, a formal letter, an e-mail, or a phone call. One option in this situation might be to conceive of the network as consisting of *repertoires* (or menus) of genres that can be drawn upon according to circumstance.

There are, I believe, several advantages that accrue to LSP research from these expansions of the role of genre. First, as Gunnarsson (1997b) persuasively argues, we now have a powerful way of reintegrating spoken and written professional discourse. Second, we can now more easily see how genres evolve and why, and not only under the pressures of technological developments. Third, our support materials can offer a more realistic mapping of the universe of discourse for which we might be preparing a particular group of students. In ongoing efforts to increase this understanding, useful recent contributions have been published on submission letters (Swales 1996), academic book reviews (Motta-Roth 1998), recommendation letters (Precht 1993), journal acknowledgment sections (Giannoni 1998), and research grant applications (Connor and Mauranen 1999).

Last year's *ARAL* chapters on Law and Medicine only need some minor rounding out via reference to work directed at the non-native speaker. Bhatia continues to be active in the area of legal discourse, especially in comparing legal with other disciplinary texts (e.g., Bhatia 1998). Harris (1992; 1997), originally a lawyer himself, is excellent on explaining non-native speaker (NNS) difficulties in legal educational settings; Fredrickson (1996) usefully shows how broader features of legal systems have their narrow discoursal effects; and Trosberg (1997) uses modifications of speech act theory to reveal differences in legislation, contracts, and conversation. A recent study by Feak, Reinhart and Sinsheimer (in press) offers an innovative analysis of the student-written but published "Law Review Note" in American law schools. However, despite the efforts of a few individuals, this is not an area of LSP that has particularly thrived in recent years; that said, one promising development is the international project on the discourses of commercial transactions under development at the City University of Hong Kong. LSP work in medicine has been particularly thin in recent years, except for synchronic and diachronic discoursal investigations of medical research articles, which *au fond* are really part of English for Academic Purposes. One of the few recent contributions is the needs analysis of medical students in Taiwan (Chia, *et al.* 1999).

LANGUAGES FOR BUSINESS PURPOSES

In recent years, Languages for Business Purposes has become a major growth area in LSP, many of the pedagogical consequences of which are well described by Dudley-Evans and St John (1998). The causes of this growth are multiple. First, this area has been historically under-researched (especially in discourse terms) in comparison to science or technology. Second, internationalization and the new globality (globaloney?) has drawn many more business people into bilingual and multilingual occupational settings. Third, the new business climate (wherein turbulence is the likely norm) has made it more and more obvious that traditional business language teaching materials (such as translating commercial letters) are becoming increasingly obsolete in today's multimedia business world. Fourth, the emerging recognition of an international marketplace has done something to bring together the strengths of the North American business-communications research tradition and the investigative and curricular skills and practices of a predominantly European tradition of languages for business.

Following the much-cited paper by Yates and Orlikowski (1992) on the genres of organizational communication (with its clever integration of structuration theory), genre and genre study has become a major starting point for analyzing and explaining these universes of discourse. However, much of the more successful work in this field has also adopted a number of additional (and triangulating) techniques such as linguistic auditing (Reeves and Wright 1996), interpretive ethnography (Smart 1998), familiarity analyis (Charles 1996), "fly on the wall" shadowing of business persons as they go about their daily routines (Louhiala-Salminen 1999), compuational analysis of a text corpus (Fox 1999), and user reactions to business discourses (Rogers in press). It seems clear that these innovative and comprehensive studies have largely heeded Devitt's admonition that "we need to find ways to keep genre embedded and engaged within context while also keeping our focus on learning about genre and its operations" (Devitt 1996:611). And here it is worth observing that in EAP we can often obtain some inkling of the reception-history of a particular text by seeing where it was published and how it was cited. In the business world (aside from focus-groups in advertising), we rarely have such traces. As Rogers (in press) points out, studies of genres have tended to conceptualize communicative purposes in terms of the strategies of the speakers or writers. She then goes on to argue that, at least in organizational contexts, such purposes cannot be fully understood without some sense of how those "purposes" are evaluated by their audiences. Hence, there is a need to incorporate user-based analyses; a superb example of this kind of work is Locker's recent study of responses to various forms of negative letters and the consequences of these findings for business communication textbooks and classes (Locker 1999).

Dudley-Evans and St John note a further important difference between English for academic and business purposes:

> EAP operates within a world where the fundamental concern is the acquisition of knowledge by individuals, while in EBP the purpose is not centered on the learner as an individual but as a member of a transactional world where the fundamental concern is the exchange of goods and services (1998:72).

As we gain increasing access to this (international) transactional world, a number of factors have emerged as being potentially relevant. First, Charles (1996) has convincingly shown that a key factor for the resulting discourse is whether participants are attempting to establish a new business relationship or merely consolidating a prior one. Second, the mode of communication (letter, phone, fax, e-mail, etc.) is also significant, as indeed we might expect (Akar and Louhiala-Salminen 1999, Nickerson 1998). Third, the primary power in the business is typically complementary to that of the academic setting: In the business relationship, the power relationship typically turns out to be with the potential buyer rather than the potential seller (Yli-Jokipii 1994). Fourth, the corporate or sectorial culture ("the way we do things around here") is quite different from the academic culture. This distinction is exemplified by Smart (1998) for the Federal Bank of Canada, Bilbow (1999) for a Hong Kong airline, and Nickerson (1998) for a multinational oil company. Finally, national cultural values and expectations add further variability and here much can be learned from Scollon and Scollon (1995) for east Asia, and Tebeaux (1999) for Mexico. These last efforts are both historically rich and subtle studies which salubriously steer their readers away from facile stereotyping.

Although it might be premature to conclude that Languages for Business has overtaken Language for Academic Purposes as the lead area in the field, there is equally no doubt that the quality gap has narrowed very considerably. One reason for this growth in Languages for Business has been a fine series of doctoral dissertations based (at least in part) on Scandinavian business settings, although good work has covered other geographical areas such as Akar (1998) for Turkish business communications and Barbara, *et al.* (1996) for Brazilian ones. Another contribution to this strength has come from a useful accumulation of particularistic genre analyses starting with Devitt (1991) on taxation correspondence and Bhatia (1993) on sales letters, and moving on to cover such disparate discourses as corporate mission statements (Swales and Rogers 1995), "chair talk" in business meetings (Bilbow 1999), and faxes (Akar and Louhiala-Salminen 1999). Basic research in this area positions LSP well for the new millenium, although there remain—as in EAP—significant issues with regard to what Language-for-Business-Purposes instructors need to know, how they are to be trained or helped to come to that knowledge, and how those insights can be parlayed into effective pedagogic delivery systems.

ENGLISH ENGLISH EVERYWHERE

One of the ironies of the emergent field of ESP is that its very success in catering to the needs of nonnative speakers has contributed to the overpowering position of English in today's worlds of science, scholarship, and business. Part of the irony is that those interested in comparing Anglo-American research rhetoric with comparable rhetorics in other languages are having increasing trouble locating sufficient numbers of those other-language texts. Indeed, there has been a massive conversion over the last two decades from other-language journals to English-medium ones, and, as far as I can see, almost all of the many new journals that have been springing up have an English-only submission policy. We are facing a real loss in professional registers in many national cultures with long scholarly traditions.

Crystal (1997) believes this trend to be a benign phenomenon, one inevitably linked with 'progress' and one that will lead to a more harmonious world. Others (Phillipson 1999, Swales 1997) strongly disagree with Crystal's excellently-written but ultimately triumphalist account. There are of course wider and important issues here that cannot be discussed in this chapter; nevertheless, the decline and disappearance of other major scholarly languages, as well as the stunted growth of aspiring new ones in developing countries, has at least one immediate consequence for LSP. Immense power is now concentrated in the hands of American academic gatekeepers; Wayt Gibbs (1995) calculated that, in 1994, 31 percent of all papers published in the world's leading journals emanated in the United States, and even five years later that percentage has probably moved upward. We are faced in effect with a growing linguistic and rhetorical monopoly and monoculture against which we need to consider offering 'cultural rainforest' arguments of the following type: "Insofar as rhetorical practices embody cultural thought patterns, we should encourage the maintenance of variety and diversity in academic rhetorical practices—excessive standardization may counteract innovation and creative thought by forcing them into standard forms" (Mauranen 1993:172). One small but direct way in which the field can resist this standardization is to transfer some of the resources and expertise that exists in ESP to lesser understood professional languages.

FINAL CONSIDERATIONS

One of the clearest signs that ESP/LSP has played its full part in the emergence of Applied Linguistics as a discipline is that the space constraints of a single short chapter prevent full coverage of the field. For instance, I have not been able to do full justice to the lively area that usually goes by the name of Contrastive Rhetoric, wherein scholars are now going beyond simply *showing* rhetorical differences between languages to now attempting to *explain* them. Nor have I adequately covered some other recent developments. One is the tremendous interest in corpus linguistics and its great, if uncertain, potential for LSP work of all kinds. Another is the rather belated recognition that many professional texts have an important visual structure that parallels that of the written word (Johns 1998, Miller 1998). Yet other developments include the impact of new forms of electronic communication, the current state of the art with regard to actual LSP pedagogic materials, recent developments in translation studies, and the question of whether ESP has been overly neutral in terms of its ideology and its attitudes toward its NNS clientele (Pennycook 1997).

Overall, we can see that LSP has a number of structural problems such as weaknesses in institutional recognition and uncertain provision of professional training. Chile, for example, a great pioneer in ESP in the 1970's, has been unable to recruit a younger generation of specialists to replace its retiring experts (Horsella, personal communication). Furthermore, although LSP has, in *English for Specific Purposes*, a flagship journal, regular attempts to get it included in the Social Science Citation Index have always failed. On the positive side, it is much more of a truly international field than most areas of applied linguistics, as this chapter has tried to show and as the provenance of papers in *English for Specific Purposes* impressively demonstrates. Its alliance with and contribution to discourse analysis is also impressive, but legitimate questions can be asked about the "applied" nature of some of these investigations, since it is not always clear how the findings are to be transmuted into teaching or study materials. All in all, though, the field has responded well to the 1964 "call to arms," both in terms of the envisioned types of linguistic analyses and in greatly extending and enriching them.

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[Introductory Note: For this section, I have selected only book-length items published after 1994. In so doing, I have made a conscious effort to include some volumes that represent important and relevant work done outside the ESP mainstream, both in terms of provenance and in terms of orientation.]

Bargiela-Chiappini, F. and C. Nickerson. 1999. *Writing business: Genres, media and discourses*. London: Longman.

This volume offers a strong collection of articles that show the current vibrancy of this LSP sub-field, especially in western Europe; it is a showcase of this sub-field's strengths in both research and application.

Belcher, D. and G. Braine (eds.) 1995. *Academic writing in a second language: Essays on research and pedagogy*. Norwood, NJ: Ablex.

This book is the key collection on the topic of academic writing, now nicely complemented by Candlin and Hyland (1999). The volume contains some outstanding case studies of academic writing situations, and throughout there is a careful balance between social and cognitive demands, and between resistance to and acceptance of typified features of academic discourse.

Biber, D., S. Conrad and R. Reppen. 1998. *Corpus linguistics: Investigating language structure and use.* Cambridge: Cambridge University Press.

This book is a comprehensive and helpful introduction to a relatively new field. Of particular interest to users of this chapter will be Part II (Investigating the characteristics of varieties). The volume as a whole is strongly influenced by Biber's multi-dimensional model of register.

Candlin C. N. and K. Hyland (eds.) 1999. *Writing: Texts, processes and practices.* London: Longman.

This recent volume offers a wide variety of approaches to writing in a variety of academic and professional settings, not all of them involving non-native speakers. However, the papers cohere around a general acceptance that institutional practices and percepts strongly influence both the construction and interpretation of written texts. Another strong feature of this volume is the serious attention given to the relation between research and practice.

Dudley-Evans, T. and M. J. St John. 1998. *Developments in English for specific purposes.* Cambridge: Cambridge University Press.

As might be expected from the authors, this volume is a model of clarity and good sense. It provides a comprehensive overview of the field and, perhaps for the first time, offers a proper assimilation of work in English for academic purpose and English for business purposes, two sub-areas that traditionally have gone their rather separate ways. As a volume in the Cambridge Language Teaching Library series, it is full of textbook extracts and has a well-constructed series of tasks for student completion. It is probably the best introduction to the field now available, even if it tends to steer clear of a number of controversial topics.

Duszak, A. (ed.) 1997. *Culture and styles of academic discourse.* Berlin: Mouton de Gruyter.

This volume is an excellent contribution to the fast-growing area of contrastive rhetoric as applied to academic discourse. Part One deals with attitudes and values, Part Two with the expression of interpersonal meaning, and Part Three with variation in genres. Duszak's own contributions, both in the introductory chapter and in her paper on "digressiveness" in Polish texts, are exceptionally good. The volume as a whole showcases recent work from Eastern Europe.

Fortanet, I., S. Posteguillo, J. C. Palmer and J. F. Coll (eds.) 1998. *Genre studies in English for academic purposes.* Castello, Spain: Universitat Jaume I.

This collection presents a strong "normal science" contribution, generally showing excellent knowledge of the literature and high-level analytic skills. Since half the contributors come from Spain, the volume demonstrates the rapid development of a strong EAP tradition in this country. The volume may not turn out to be as well known as it deserves to be because of its relatively obscure provenance.

Grabe, W. and R. B. Kaplan. 1996. *Theory and practice of writing.* London: Longman.

This is a substantial volume (of close to 500 pages) that examines all aspects of writing from an applied linguistics perspective. The chapters of greatest interest and relevance to LSP are those devoted to contrastive rhetoric, writing for professional purposes, and teaching writing at advanced levels.

Gross, A. G. and W. M. Keith (eds.) 1997. *Rhetorical hermeneutics: Invention and interpretation in the age of science.* Albany, NY: State University of New York Press.

As the title might intimate, this is a challenging volume, but one of great interest to all those seriously interested in analyzing the language of science. Among the important issues the contributors discuss are the agency of the author, whether our clever analyses of technical texts reflect authorial intent or merely our own close reading, and whether at these higher levels of interpretation we are essentially staring into the mirror of our own imagination. The volume is something of a slugfest among contemporary rhetoricians, and engaging for that additional reason, although McCloskey clearly goes over the top. The editors provide an authoritative and intriguingly self-reflexive introduction.

Gunnarsson, B-L., P. Linell and B. Nordberg (eds.) 1997. *The construction of professional discourse.* London: Longman.

This wide-ranging volume covers many fields, such as law, medicine, science, and social work. A number of the chapters provide instructive accounts of discourse in specialized communities of practice, how this discourse is socially constructed, and how it operates to validate and reify the values of the institution within which that discourse is situated.

Johns, A. M. 1997. *Text, role and context.* New York: Cambridge University Press.

Like several of its predecessors in the well-known Cambridge Applied Linguistics series, this volume is important for both its theoretical and practical contributions. Johns' chosen territory is the acquisition of academic literacy by incoming university students from disadvantaged backgrounds, and she succeeds in showing how a complex approach drawing on genre, community, and multiple modes of apprenticeship can be made to work. This book is one of few recent volumes to fully integrate research, theory, and practice.

Jordan, R. R. 1997. *English for academic purposes: A guide and resource book for teachers.* Cambridge: Cambridge University Press.

For this volume, Jordan has pulled a vast amount of material together, and manages to do so in such a way that research, pedagogical application, and practical illustration are well indicated. However, the volume somewhat over-favors British work and tends to avoid certain contemporary theoretical and ideological issues.

Louhiala-Salminen, L. 1999. *From business correspondence to message exchange: The notion of genre in business communication.* Jyväskylä, Finland: University of Jyväskylä.

This study integrates the theoretical framework of genre analysis and traditional notions of business communications. It then views the traditional business letter and the new genres of fax and e-mail through this lens. This monograph can serve as an exemplar of the quality of current studies in LSP business communications.

Miller, T. (ed.) 1997. *Functional approaches to written text: Classroom applications.* Washington: USIA. [Originally *THE Journal.* 2/3. Paris: TESOL France. 1995.]

Tom Miller of the USIA has here succeeded in pulling together a group of (mostly) leading specialists in their fields in order to demonstrate how discourse analysis can be put into practical effect. The coverage is particularly wide (reading, writing, critical discourse analysis, genre, grammar, concordancing, etc.) but the overall effect is remarkably coherent. This volume is one of the best volumes on applied discourse analysis available.

Prior, P. A. 1998. *Writing/disciplinarity: A sociohistoric account of literate activity in the academy*. Mahwah, NJ: L. Erlbaum.

This volume is a culmination of a long series of studies conducted by the author in recent years. If Johns (1997) is concerned with the enculturation of undergraduates, Prior is concerned with that of graduates. *Inter alia*, he is able to demonstrate, via extremely detailed casework, that this process is much more complex and multi-faceted than the field had hitherto imagined. Because of his striking findings, this important work needs replicating in other fields of endeavor, such as science, engineering, and medicine.

Swales, J. M. 1998. *Other floors, other voices: A textography of a small university building*. Mahwah, NJ: L. Erlbaum.

This is the first book by this author which is not directly concerned with LSP issues. Rather, it explores discoursal life in a small academic building, and then examines the textual lives of seven individuals, four botanists and three applied linguists. One of the book's main purposes is to re-examine—and perhaps rehabilitate—the concept of discourse community.

Valle, E. 1999. *A collective intelligence: The life sciences in the Royal Society as a scientific discourse community*. Turku, Finland: University of Turku. [Anglicana Turkuensia No 17.]

This volume is the latest is a fine series of discourse-based studies showing the evolution of scientific discourse. Once again, we find here a complex methodology ranging from standard historical research to very fine-grained studies of citations and modes of reporting the work of others. The author concludes that while the discourses she examined have remained dialogic over the last 300 years, that dialogue has consistently become more centered on the public rather than the private domain.

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LSP IN NORTH AFRICA: STATUS, PROBLEMS AND, CHALLENGES

Mohamed Daoud

INTRODUCTION

This chapter presents a survey of recent developments in teaching Languages for Specific Purposes (LSP) in North Africa[1] and discusses current issues and future challenges. It devotes more space to ESP in this francophone environment given the greater demand for English, as opposed to other languages, and the more abundant ESP activity in terms of practice, research, and publications.

In Northern Africa, the challenges for the next decade and beyond are considerable but exciting: First, while the demand for LSP, and ESP in particular, is clear and the political discourse which reflects such a demand is unequivocal, there is a lack of policy and planning commitments to ensure the professional development and delivery of LSP services. The obstacles, in this case, include central control, institutional inertia, and, with respect to ESP in particular, continuing resistance to the spread of English in a French-dominant educational and economic system. Second, current ESP/LSP practice is largely ad-hoc, lacking in course design, teacher training, sufficient instruction time, and proper evaluation. The challenges, in this respect, involve developing true specific-purpose curricula (based on learners' needs) which would provide the appropriate context for sustainable language programs. Third, as in other parts of the world, there is an increasing demand for language training for occupational business and vocational purposes added to the established instruction in English for Academic Purposes (EAP). The additional challenges, in this case, include the provision of good teacher-education programs (necessarily post B.A.) which require that the universities that offer such training open up to the professional and vocational sectors and learn to work with them. This demand will, of course, have an impact on the content and methodology of applied linguistics degree programs. Fourth, there are theoretical challenges which will keep applied linguists who are interested in ESP/LSP oscillating between theoretical pursuits and practical applications.

Theoretical frameworks for ESP course design and teaching, in particular, have to be adaptable to the local contexts where LSP programs are needed. At the same time, localized LSP practice, which is socioculturally embedded, must inform theoretical developments. In all of these challenges, mainstream (Anglo-American) and local ESP practitioners have every reason to work together.

THE NORTH AFRICAN CONTEXT

The language of everyday communication in North Africa is the oral dialect of the country (Tunisian, Algerian, and Moroccan Arabic), together with Berber in Algeria and Morocco, where the Berber population is around 15 percent and 30 percent, respectively. Modern Standard Arabic (MSA), which is taught at school, is the language of instruction in elementary and early secondary education. It is later restricted to teaching the humanities and social science subjects through college. French is well established as a second language, although it is officially labeled the first foreign language. It is taught no later than the third year of elementary education and becomes the medium of instruction of math, science and technology, and business subjects in late secondary education and at the university level. Thus, it competes with, or predominates over, both MSA (in government administration, private business, and the media) and the local dialects, particularly among the educated (Battenberg 1997, Daoud 1991b, Walters 1999).

English is taught as a foreign language for up to six years in secondary education at the rate of 2-4 hours a week; then it becomes a required subject in all the tracks of vocational training and higher education. Other foreign languages (e.g., German, Italian, Spanish) are taught as additional optional languages in late secondary education and the university level, but their spread is not at all comparable to English.

ESP practice started in North Africa in the early 1960s, much as it may have arisen in other countries in the Middle East, Asia, and Latin America, with expatriates teaching English to engineering students. The first major ESP event on record in North Africa was *The Hammamet Conference on English for Special Purposes*, held in Tunisia in February 1975 (Payne 1979). It brought together over fifty ESP practitioners including teachers from Tunisia, Algeria, Morocco, and Libya; expatriate teachers from Egypt and Sudan; specialist speakers from Britain and the U.S.; and aid agency representatives. In the conference resolutions, the local participants commented: "We recognize the increasing role of English in our countries and the urgent need for a shift towards more appropriate language programs, tailored to the needs of the area." However, they noted with regret that "no North African scholars read papers at this conference, which was at times too theoretical and not immediately relevant to this area" (Payne 1979:95).

The last remark remains, although to a lesser degree, a characteristic of ESP in this EFL context and a challenge to mainstream and local ESP practitioners. For even though ESP instruction is now assured by local teachers, the region continues to draw heavily on guest speakers, research references, and textbooks from the U.K. and the U.S. Local practitioners, who are mindful of the linguistic and sociocultural characteristics of local learners and their educational/ work environment, are acutely aware of the need to develop ESP locally to ensure a reasonable degree of effectiveness and professionalism.

The next major development was the establishment in the early 1980s of ESP resource-center projects (ESPRCP) which were funded by the British Overseas Development Administration (ODA) (Bencherif 1993, Kennedy 1985, Thomas 1993). Such projects helped set up advisory units for in-service teacher training and materials design and encouraged local discussion and research of ESP through seminars and conferences (e.g., *the Maghreb ESP Conference*, a biennial event held in 1993, 1995, and 1997) and publications (*Tunisia ESP Newsletter* and conference proceedings).

The measure of success of these projects was the development of long term sustainability through local staffing and funding (Kennedy 1985, Seymour and Bahloul 1992). The Tunisian ESPRCP has survived. With the end of ODA funding in 1995, it gained official recognition as a department for the promotion of ESP and has now grown to reach a large ESP teacher/researcher population (over 600 regular users) and to help sustain an M.A. program in Applied Linguistics/ ESP (Daoud, *et al.* 1999). The Algerian ESPRCP faded in the mid-1990s in spite of the hard work and commitment of local practitioners (see separate reports by Meliani, Belkenshir, and Bensouiki in *Maghreb ESP Conference* 1993) as a result of political instability in the country. ESP activity in Morocco was judged not substantial enough (El-Haddad 1993, Najbi 1997) to receive ODA support for a similar project.

Thus, ESP has been growing, although in jumps and starts. In Tunisia, it has become a required subject at various levels of education and vocational training (Daoud 1996a; 1998a; 1998b). It is also in great demand in the public and private sectors (Daoud and Labassi 1996).[2] However, questions remain about whether what is being offered is true ESP given the lack of proper needs analysis, teacher training, and evaluation (Daoud 1999, Seymour 1993). It seems that these questions will stand for the foreseeable future for a number of reasons which are explored later in this chapter.

It is important to note, however, that ESP is not the sole issue in LSP concerns in North Africa. Issues involving other languages also need to be reviewed in order to assess fully the role of LSP in the region. The reader will soon realize that the current problems and future challenges relative to ESP readily apply to other languages, which lag far behind in terms of practice and research.

THE CURRENT STATE OF LSP

The experience of the *Institute Bourguiba des Langues Vivantes* (IBLV) in Tunis, in terms of developing LSP, is unique in North Africa and may, therefore, be described as the best case scenario for LSP development in the region. Since its founding in 1964, this institution has taught several foreign languages to the general public as well as to clients with specific needs from the public and private business/industrial sectors. It even developed B.A.-level programs combining at least two languages and focusing on business communication skills and translation (*Maîtrise combinée de langues, M.C.L.*). These languages include Italian, Spanish, German, Russian, Chinese, and Japanese, in addition to French and Arabic for professional and business purposes.

Given the greater demand for these languages, the M.C.L. (which was abandoned in the 1980s) was reborn in 1996-1997 as the *Maîtrise de langues vivantes appliquées (M.L.V.A.)* [B.A. in modern applied languages[2]], with specific application to business communication and practices (Department of Languages 1996). The curriculum involves language and discourse practice, translation, cultural awareness raising through lectures and seminars run by language and business specialists, on-site visits and training, and case studies. In the same year, the IBLV also started a diploma program in translation involving the three main languages (MSA, French, and English), with an applied orientation to market demands.

The main justification for these programs is twofold: 1) to supply businesses with operational language users in specific domains as Tunisia gears up for economic partnership with the European Union (which takes effect in 2007), and 2) to help language-degree holders find jobs in the socio-economic sector (government, banking, tourism, NGOs, etc.) as opposed to joining the saturated ranks of language teachers. ESP practitioners should note with interest that English is required in all of these LSP programs.

The IBLV has also proposed to offer a professional diploma in French for Specific Purposes (FSP) [*Diplôme d'études supérieures spécilaisées (D.E.S.S.) en français à des fins spécifiques*], which departs from the traditional literature/ civilization-track prevailing in the university system. The degree program has four goals:

1. Address learners' needs for French for professional purposes,
2. Help employees secure promotion through a higher level of functional literacy in the language,
3. Promote the teaching of French for academic and occupational purposes in the educational system, and
4. Develop appropriate teaching materials for FSP.

The proposal concludes with the blunt statement that "the specific framework for the mastery (of FSP) and for research leading to this mastery is non-existent" (Department of French 1999:2, translation from the original French). The French department has already taken steps to model this program after the ESP program already in place since 1995 and to support it with an FSP resource center.[4]

POLICY AND PLANNING FOR ESP

ESP in North Africa has always suffered from a status problem. It has been sustained through the commitment of ESP teachers, the enthusiasm of certain deans and subject-specialist teachers, and the financial assistance of foreign aid agencies representing U.K. and U.S. interests. The official attitude, although unstated, is something like the following: 'It's their (U.K. and U.S.) language; if they want to promote it like the French promote their language, they will help us financially.' Paradoxically, the official discourse has been unequivocal about the need for English, but there has never been an official provision to structure ESP activity in the various higher education institutions. The Tunisian government has probably gone the furthest in the region in generalizing the teaching of English in the educational sector; however, it has failed to provide the resources to design proper ESP curricula or the incentives to motivate ESP practitioners to teach ESP and investigate it. Over 95 percent of the ESP teachers are on loan from secondary schools and thus receive little or no recognition from university faculty, while those who undertake postgraduate studies in ESP are promoted out of ESP instruction and into traditional English departments (Daoud 1998b; 1999, Daoud, *et al.* 1999; but note that such a state is not uncommon elsewhere, cf. Swales 1984; 1994).

This situation stems from a lack of policy and planning commitments to ensure the professional development and delivery of ESP services, which may be explained by several factors, including central control, institutional inertia, and continuing resistance to the spread of English in a French-dominant educational and economic system. With respect to central control, the agencies in charge of curriculum planning have a top-down approach. They do not listen to the practitioners in the field, allocate too little time for ESP instruction, and set common examination criteria that are at odds with the nature of ESP practice.

As for institutional inertia, it is reflected in the statements, beliefs, and perceptions of many top decision makers, deans, and even university faculty relative to ESP: 1) *'anybody with an English degree can teach ESP,'* 2) *'learning ESP takes a short time,'* and 3) *'designing ESP course materials is easy and costs nothing.'* In the private sector, where the notion of a long-term language program is not palatable, the common practice is to hire someone with an English degree, expect him/her to quickly learn about the business, and then act as a translator/ communication facilitator with English speaking clients, rather than invest in training the relevant personnel in ESP. Inertia also leads to poor planning such that, when the teaching of ESP was generalized to all students in the latest reform of higher education in Tunisia (Daoud in press b), no measures were taken to design ESP courses, retrain practicing teachers, or recruit enough new ones. Instead, the Ministry required practicing teachers to teach 50 percent more hours and instructed deans to hire part-time teachers for the remaining groups.

A further explanation for the lack of commitment to ESP may be a resistance to the spread of English, especially from the *Centre culturel français*, which seems to counter efforts that may undermine the position of French in the region (Battenberg 1997). This resistance is also felt among French-educated administrators and faculty who seem to be concerned about losing their influence (Daoud 1991b). However, what is sometimes perceived as resistance to English may simply be linguistic realism relative to the promotion of other languages, given the greater economic activity between Tunisia and other non-English speaking countries in the European Union (France, Italy, Germany, etc.), with the U.K. and the U.S. coming later in order of importance (cf. Kaplan and Baldauf 1997, ch.6, on the language policy and planning dichotomy).

It is interesting to note that the mainstream ESP literature hardly addresses these issues. In the last seven years, *English for Specific Purposes: An International Journal* published no articles on the matter and only one book review (Kaplan 1998). Dudley-Evans and St John (1998), Johns and Dudley-Evans (1991), and Robinson (1991), the defining references on ESP, do not discuss these important obstacles in the way of ESP as an international movement. In his review of Robinson's book, Markee (1993) notes this oversight and states:

> ...[O]ne of the most useful current developments in ESP which is showing signs of being picked up by the wider profession is the interest in treating language curricula as innovations whose development has to be carefully managed. I predict that by the time Robinson writes the third edition of this book in the year 2000, an entire chapter on this topic may well be necessary (1993:265).

The year 2000 is upon us and yet ESP teacher-training programs are only beginning to address these issues. Among the twelve ESP degree/certificate programs listed in Holden (1998), only one offers a language policy course, while another offers a course on the management of change in teaching situations. Daoud (1999) discusses some of the obstacles to ESP growth in Tunisia in terms of the management of innovation and concludes by questioning the commitment of Tunisian educational policy makers to ESP development:

> One is led to wonder whether English is truly desired in the official school system in spite of official and semi-official (media) pronouncements about its importance. If English is desired, even as a commodity in this global business and technological era, then there is an urgent need for a clear policy, a coherent structure and adequate resources for curriculum development and innovation (1999:135).

These issues are occasionally addressed by international ESP guest speakers in local contexts (e.g., Grabe 1996, Swales 1993; 1994); however they are given more attention in the language policy and planning literature (Kaplan and Baldauf 1997, chapters 5 and 9, and Hornberger and Ricento 1996) and in references dealing with the management of change, innovation, and quality control in ELT (cf. Christison and Stoller 1997, O'Dwyer 1996, and the literature stemming from the *Best Practices* work on EPP/EOP, Lomperis 1997).

The challenge for ESP practitioners is to influence language policy and planning, with the bulk of this responsibility falling to local practitioners who are more attuned to the political culture of their country rather than to the occasional guest speaker or foreign aid agency representative. Local ESP program coordinators and project directors need to learn the appropriate communication and negotiation skills to get through to decision makers and curriculum planners. This goal requires understanding that the decision makers may not necessarily be opposed to ESP, but simply working under their own political, financial, and other constraints. The practitioners' negotiating positions would be strengthened by the professionalism they would show in doing their work; however, this professionalism may not be easy to achieve because one is rarely afforded the resources for self-improvement (e.g., attending management courses and professional conferences).

CURRENT ESP PRACTICE AND HUMAN RESOURCE DEVELOPMENT

Current ESP practice in this part of the world is largely ad-hoc, lacking in proper needs analysis, appropriate course design, materials production resources, teacher training, sufficient instruction time, and assessment and evaluation guidelines. Daoud (1999) finds that while general EFL practice in basic and secondary education benefits from an established institutional structure in the Ministry of Education. ESP is left in the hands of individual teachers who may be appropriately called "islands." Seymour, who managed the ESPRCP in Tunisia from 1989 to 1995, draws their profile:

> Most are Tunisians who have Tunisian degrees in 'English' studied through the medium of English. However, few have been trained as teachers and most have never studied TEFL at all, let alone TESP. Many have traditional attitudes to teaching and learning and tend to concentrate on reading and *explication de texte*. This seems to consist mainly of giving students *textes*, chosen only because of their subject content, and setting comprehension questions. There is rarely any real teaching, just practice (Seymour 1993:19).

As the number of ESP teachers grow in several higher education institutions, coordinators are designated to run what are called *ESP sections*, for they were refused departmental status. With a few exceptions, coordination remains cosmetic, leading to the production of sketchy syllabi of little relevance to the learners' needs. This probably arises because the coordinators are not trained for syllabus design, nor are they given the authority and resources to do it.

Nonetheless, the ESPRCP has succeeded in establishing and sustaining an in-service training scheme for ESP teachers in higher education through professional events (three national ESP seminars per year, a summer school program, and the Maghreb ESP Conference) as well as the provision of up-to-date reference materials and on-site advice. It also helps sustain pre-service training in two advanced degree programs offered by the IBLV—*D.E.S.S.* [specialized higher education diploma in ESP] and the *Diplôme d'études approfondies (D.E.A.) en linguistique appliquée* [M.A.in Applied Linguistics/ESP]; it awards scholarships to do postgraduate studies in ESP; and it makes available to students adequate research references as well as a computer station with statistics and concordancing software and an Internet connection (Daoud, 1998a, Daoud, *et al.* 1999).

This coordinated effort is shoring up the professionalism of practicing teachers and producing a new generation of trained practitioners and able researchers in such areas as genre analysis (e.g., Labassi 1996; to appear), classroom research on reading strategies (Dhieb-Henia to appear), writing processes (Mahfoudhi 1999), contrastive lexical research (Annabi 1997), program evaluation (Oueslati 1998; see Daoud, *et al.* 1999), as well as materials production and evaluation (Daoud, *et al.* 1998/1999). The postgraduate program in ESP and the ESPRCP have helped to create a research environment suitable for informed discussion of ESP and the promotion of teamwork. Nevertheless, more work remains to be done.

Local experience has shown that the availability of international ESP textbooks for teachers to photocopy for their students only helps to promote ad-hoc ESP practice. It often happens that a textbook off the shelf quickly supplants a sketchy syllabus which may have taken much effort to produce. Because individual ESP teachers are the ones who deliver the teaching in the classroom, they are ultimately the ones who determine the success or failure of ESP courses. Thus, teacher (re)education will remain a condition for the promotion of ESP in North Africa, for it will allow ESP teachers to make informed decisions at every level of practice, including the adoption or adaptation of international textbooks.

The English for Occupational Purposes (EOP) textbook series, which was designed for the Ministry of Professional Training and Employment (Daoud, *et al.* 1998/1999) has, for example, proven to be a suitable context for promoting several aspects of ESP practice in the local environment, which makes it worthy of duplication for higher education. It has served as a context for, among other things, 1) improved communication and negotiation with policy makers, 2) better collaboration with subject specialists and a deeper understanding of their discourse communities and communicative culture, 3) hands-on teacher education concerning theoretical developments in ESP research which informed materials design, and 4) constructive feedback on teachers' classroom performance while the materials were being piloted, bearing in mind that most of the teachers were co-authors of the textbook series.

This work was inspired by mainstream genre analysis research, task-based curricula, and strategy training, and by more recent ethnographic research in specific discourse communities (see references below). This approach is in line with the *Best Practices* literature (Lomperis 1997), which sets the trend for future curriculum design, particularly in light of the growing demand for English for Occupational Business Purposes (EOBP), English for Professional Purposes (EPP), and EOP, in both pre-employment vocational training and workplace retraining (cf. Dudley-Evans and St John 1998). The *Best Practices* work sets specific criteria for planning, implementing, and evaluating EOP/EPP curricula, but it also incorporates non-traditional aspects of ESP practice from the business and management culture, such as communication and negotiation skills, market research, marketing, and independent consultancy.

The evolving branches and sub-branches of ESP and the incorporation of business principles in the planning and delivery of ESP services present enormous challenges for practitioner training programs. (I would even argue that the label 'ESP teacher' no longer seems appropriate for anyone involved in the field, because of the multiple roles required by this job, which in turn requires multidisciplinary knowledge and a variety of skills.) ESP practitioner training, then, requires that the universities offering such training open up to the business and occupational sectors and learn to work with them. These issues are addressed by Eustace (1996) on changing business communication practices vs. classroom practice, Louhiala-Salminen (1996) and Lumley (1998) on language-trained vs. occupational experts' ratings of EOP proficiency, and Jacoby and McNamara (1999) on the variable assessment of communicative ability in EOP and on the use of peer training for academic presentations. This expansion will, of course, have an impact on the content and methodology of Applied Linguistics/ESP degree programs.

THE FUTURE OF ESP: INTERNATIONAL SCOPE, ANGLO-AMERICAN PARADIGM, LOCALIZED PRACTICES

There is a general consensus in the ELT profession and in the broader field of Applied Linguistics that ESP is international in scope (Johns and Dudley-Evans 1991), regardless of whether English is called an *international language*, a *world language,* or a *lingua franca* (Kachru 1997). Initial ESP practice in the early 1960s, together with some of the earliest textbooks and research on English for Science and Technology (EST) (see Swales 1988), all attest to this international outlook (e.g., the predominant use of English in international journals of science and technology and medicine [Gibbs 1995], as well as the more recent surge in Business English [St John 1996]).

In North Africa, no one questions the international *scope* of ESP, but many question its international *nature*. There are two concerns in particular: 1) the relevance of ESP ideas and practices from the "inner circle" to this part of the world in the "expanding circle" (Kachru 1997), and 2) the local contribution to these ideas and practices.[5] The appraisal of the first ESP conference in North Africa—regretting that no local practitioners presented papers and commenting that the conference "was at times too theoretical and not immediately relevant to this area" (Payne 1979:95)—is still echoed by local ESP practitioners even though 99 percent of the teachers are now North African and a growing number of local practitioners are producing appropriate teaching materials and reliable research.

Rather than blaming mainstream ESP experts for failing to adapt their theories and practical solutions to the North African context, this appraisal is meant to call local practitioners to the task of contributing to ESP research and practice. There is a heightened sense that local awareness of learners' linguistic, educational, and cultural backgrounds (Daoud 1991a; 1996b, Hemissi 1987; 1993, Labassi 1995; 1996, Lowe 1992; 1996), together with knowledge of the local political, financial, and administrative constraints (Daoud 1998b; 1999), favors the design of appropriate responses by local ESP practitioners.

It should be clear, though, that just as such responses draw on the mainstream ESP/Applied Linguistics research literature, it is possible that mainstream research is augmented by the localized responses and the processes underlying them. This interaction is, in fact, what would make ESP truly international in nature. International ESP experts often testify to the superior quality of localized ESP projects and practices and regret that they never appear in international publications (e.g., Johns and Dudley-Evans 1991). Local practitioners must publish then and let the so-called gatekeepers do their duty.

There are legitimate reasons for local practitioners to question the relevance of mainstream ESP research and practice, and they would be unwise not to do so. For instance, (Hemissi 1993) argues that the linguistic background of North African ESP learners results in a variable degree of proficiency in MSA and French, but no native speaker mastery or awareness of either one. For this reason, mainstream ESP materials and teaching approaches that were originally designed for ESL audiences may be helpful, but not necessarily suitable for these learners, and they would have to be adopted only with great caution and flexibility.

For other local practitioners, *in situ* investigations of needs indicate that the literature and materials produced in the U.K. and the U.S. may not suit these needs. Local studies have called for teaching specific skills and strategies such as translation skills[6] to help researchers read and publish in English (Labassi 1995; 1996). These skills include: 1) raising awareness of the variable use of symbols and other non-verbal devices in English and French scientific discourse (Lowe 1992; 1996) as well as prefixes in medical discourse (Annabi 1997), 2) promoting cross-linguistic rhetorical and genre awareness in processing EST discourse

(Daoud 1991a; 1996b), and 3) developing metacognitive strategies to aid expeditious and careful reading (Dhieb-Henia to appear, cf. Weir 1997). On the other hand, Daoud (in press a) shows that subject-specific teaching, learning, and evaluation practices in this educational environment have an impact on the motivation of ESP learners, and these practices require specific training for ESP teachers if teachers are to motivate not only their students but also their subject-specialist colleagues and deans.

On a more abstract level, the theoretical paradigm for ESP research[7] seems to us very Anglo-American (or rather "American-Anglo"), always with English as the language of reference (see Swales 1993; 1997). This emphasis is true of the growing number of EAP studies on dissertation writing which promote the Anglo-American model of exposition. Yet we know that in academic contexts, as well as in professional and occupational ones, interlocutors are more and more likely to be non-native speakers of English (Johns and Swales 1998).

ESP, and applied linguistics in general, would gain from a truly international investigation of ESP learners' communicative uses of the languages they already know (see Johns 1997, Barbara, *et al.* 1996) in order to inform ESP research and practice. The international nature of ESP would only be strengthened if more projects involved American/British and international ESP practitioners. This partnership would help us all understand, for instance, how multilingual discourse communities function in specific academic/occupational domains, how sociocultural variables in NNS-NNS domain-specific interaction in English influence communication (e.g., in terms of amount and patterns of communication, degree of accommodation to the interlocutor, etc.), how the nature of strategic behavior can vary in oral/written interaction, and how the transfer of strategies can be promoted across language backgrounds.

These complex questions will keep applied linguists who are interested in LSP oscillating between theoretical pursuits and localized practical applications. Theoretical frameworks for LSP program design and implementation have to be adaptable to the local contexts where LSP is needed. At the same time, localized LSP practices, which are socio-culturally embedded, must inform theoretical development.

CONCLUDING REMARKS

This survey has discussed issues of language policy and planning and the viability of the ESP/LSP movement in North Africa more than the pragmatic aspects of ESP research and practice. Some of the more pragmatic theoretical issues that will retain our attention in the next decade include further investigation of such common notions as communicative competence, genre, and discourse community. These notions are still in need of empirical definition and socio-cultural validation. Subject specialists have perceptions of communicative competence and ratings of language proficiency that are different from ours (cf.

Jacoby and McNamara 1999, Lumley 1998). They may belong to a specific discourse community, but they also participate effectively in other communities based on shared goals, cultural norms of communication, and the principle of interdisciplinarity, indicating an overlap of communities and an extensive use of strategies for switching discourse modes and communication styles (Bazerman 1998). Subject specialists also use/produce genres with a degree of flexibility that is only beginning to be examined in current applied linguistics research (Atkinson 1999, Bhatia 1997).

Improving our understanding of these notions for the sake of adequate application will require collaborating with subject-specialist informants and, when possible, doing ethnographic textography (Swales 1998). This evolution will also require further research at the macro-level (even though the macro/micro distinction is somewhat artificial) along the lines of contrastive rhetoric (cf. Mauranen 1993, Swales, *et al.* 1997), sociocultural literacy (Johns 1997), diachronic studies of genres (Salager-Meyer 1999, Labassi to appear), and critical discourse analysis (Huckin 1997); at the micro-level, research will focus on grammar (e.g., Biber, *et al.* 1996) and vocabulary (Coady and Huckin 1997).

On the instructional side, classroom based research and reflective teaching will be more significant in the next decade and beyond in order to achieve a reasonable match between theoretical approaches and actual course design and teaching. Current reading research, for instance, is just beginning to address strategy training issues in real ESP teaching contexts (cf. Dhieb-Henia to appear, Grabe 1996, Weir 1997). With respect to teacher education, much remains to be done to help teachers incorporate in their lessons insights from research on grammar and style (e.g., Biber, *et al.* 1996) and vocabulary (Coady and Huckin 1997). On the other hand, practitioner education, particularly for ESP program coordinators and project managers, will receive more attention along the lines set out in O'Dwyer (1996) and Christison and Stoller (1997), although there again, the predominance of the Anglo-American model of management will have to be more sensitive to local political and educational cultures around the world.

This brief survey shows that the current theoretical and practical concerns of ESP practitioners are truly within the realm of applied linguistics, for they embrace issues of language policy and planning, language teaching and practitioner training, functional literacy skills in specific discourse communities, language assessment, program evaluation, and language program administration. Looking forward to the next decade and beyond, the multidisciplinary, and increasingly multicultural, nature of ESP will keep it in the forefront of applied linguistics research and maintain its trail-blazing role for general ELT and for the teaching/learning of other languages for specific purposes. North African applied linguists will play their part in the global growth of ESP by designing localized solutions to present and future language-related problems.

NOTES

1. The label "North Africa" designates three countries in the Maghreb in particular: Tunisia, Algeria, and Morocco, because they have a very similar linguistic profile and educational structure. There has been substantial ESP activity in this region for more than three decades, particularly in Tunisia and Algeria, although in the latter country it has been affected by the unstable political situation since 1991. In Morocco, ESP has not yet reached the same degree of official recognition and public awareness as in Tunisia and Algeria (El-Haddad 1993, Najbi 1997).

2. The demand for English is so unprecedented that the numerous providers are turning back clients. In Tunisia, providers include the *Institute Bourguiba des Langues Vivantes* (IBLV) which has branches countrywide, the British Council, AMIDEAST, the Tunisian American Chamber of Commerce, as well as many private educational institutions which are thriving on courses in English for business and management. This demand is also indicated by the increasing number of job ads appearing in English in a leading Tunisian newspaper published in French (Labassi in press). There is a project underway to survey the ESP needs of several business organizations, carried out by a group of graduate (M.A. level) students (Jabeur 1999).

3. Programs in other languages used around the Mediterranean are possible in the future, depending on public demand and the availability of qualified instructors: Greek, Turkish, Persian, Hebrew, Portuguese, etc.

4. The programs described in this section are now run by the *Institut Supérieur des Langues de Tunis* (ISLT) which separated from the IBLV in September 1999.

5. In North Africa, most ESP practitioners hold the moderate, pragmatic view that English is *the* international language of communication, particularly in science, technology, and trade. It should be promoted as a service language in as professional a manner as possible, but not to the exclusion of other languages (Walters 1999). A few hold an ideologically strong view which associates English with the hegemonic power of multinational/American companies and the impoverishing policies of the World Bank and the IMF (cf. Mchala 1999, Pennycook 1997). However, nobody really accepts the simplistic views that ESP/EAP is neutral (Allison 1996) or that English is innocent (Widdowson 1998).

6. Translation has received scant attention in mainstream ESP research, and in the collection of over 1000 recently published ESP textbooks available at the ESP Resource Center in Tunis, I have not found any translation activities. This is an area worthy of attention as ESP practitioners feel the need to develop basic translation skills: University students often use English references, but they write their exams and papers in French. More advanced researchers who want to

publish in English or give presentations at international, and even national, conferences often write their papers in French then ask English teaching colleagues to translate their drafts. Those who feel confident enough to write originally in English often produce French-sounding prose (Daoud in press a, Daoud and Labassi 1996, Labassi 1996). Translation training is also critically needed by business professionals and administrators, as demonstrated rather dramatically by the Tunisian president's 1995 visit to South Africa with leading Tunisian businessmen, only to discover that they did not have the adequate English proficiency to achieve the aims of the visit.

7. Shulman defines a paradigm in terms of "principles of regularity and cannons of evidence" (Shulman 1988:9).

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This is a 100 percent Tunisian EOP textbook series for students seeking to obtain a vocational certificate or diploma for employment in more than 150 different specialties. The series includes eight volumes, three for the first year (levels 1 and 2), and five for the second year (level 3). This product is unique in Tunisia not only because of the quality of the materials (which are in some respects superior to international textbooks), but more importantly because of the process that was involved in producing them. This process started with needs analysis and syllabus design (in 1996–97), and is now concluding with materials evaluation and revision in light of classroom observation and teacher feedback. This project has served as an appropriate context for interacting professionally with the various stakeholders in the Tunisian vocational training system, and for educating teachers about the various roles they have to play in course design, lesson planning, classroom practice, learner assessment, and materials evaluation. The project has had the added advantage of promoting team work.

Dudley-Evans, T. and M. J. St John. 1998. *Developments in English for specific purposes: A multi-disciplinary approach.* Cambridge: Cambridge University Press.

This book is a state-of-the-art volume on ESP, long-awaited after Hutchinson and Waters (1987) and Robinson (1991). Its main strengths include: 1) updating the reader on major developments in the field which has become more multidisciplinary than ever before as it continues to seek distinction within ELT, and 2) defining the various roles that the ESP teacher/practitioner must perform professionally. Its main weakness, though, is that it avoids language policy and planning issues and avoids an ideological stance on ESP as an international phenomenon.

Kaplan, R. B. and R. B. Baldauf Jr. 1997. *Language planning: From practice to theory.* Clevedon, UK: Multilingual Matters.

Two sections in this book are of special interest to the applied linguist/ESP practitioner (chapters 6 and 9). However, the rest of the book makes very interesting reading as well for those who want to understand the wider political context which constrains practice. The book defines the discipline of language policy and planning, discusses various international examples of practice, and from a review of practice attempts to define a theory: Hence the subtitle, *From practice to theory.* In this sense, the book sets the ground rules and techniques for the localized investigation of language policy and planning and for writing a series of books on the subject in various parts/countries of the world.

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LITERACY

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WRITING, LITERACY, AND APPLIED LINGUISTICS*

Ilona Leki

INTRODUCTION

The first charge to the contributors to this volume was to consider applied linguistics from the point of view of the subfield each of us represents. Such a formulation constructs writing and literacy research as subordinate to the superordinate domain of applied linguistics and this was not one that corresponded well with my own sense of my work in relation to applied linguistics. To investigate this issue further, I informally questioned other writing researchers about whether or not they consider themselves applied linguists and what they do to be applied linguistics.

The small set of answers revealed quite a split, with one group of writing/literacy researchers immediately embracing applied linguistics and defining themselves as applied linguists (even wondering what else they could be). The attitude of the other (mainly North American) group was more agitated, almost denouncing applied linguistics as pointlessly aspiring to be scientific, overly oriented toward quantitative research on narrow, decontextualized issues, ideologically naive, and yet profiting from the *cachet* of linguistics and of science such that calling oneself (however resentfully) an applied linguist lent credibility to the work of researchers otherwise thought of under the less prestigious rubric of ESL. (See Vandrick's [1997] suggestion that ESL teachers at the tertiary level in the U.S. may sometimes even hide their own identities and attempt to "pass" as English or writing teachers rather than ESL teachers, many of whom at this level are basically writing/literacy teachers.)

The reasons for such an odd configuration of allegiances are probably historical. Since structural linguistics viewed spoken language as core, teaching L2 writing and reading was long considered primarily a means of reinforcing oral language learning. Thus, as applied linguistics split away from linguistics in the 1940s and 1950s to focus less on the science of language and more on language teaching (Grabe 1992), it began with a legacy of interest in spoken rather than written form. Furthermore, research in SLA (at least among those who do discourse analysis) has continued to focus on oral language, despite the fact that probably most adult and many adolescent L2 learners depend heavily on written forms to further L2 language development.[1] This applied linguistics focus on oral forms created a potential for the separation of the two sister fields of applied linguistics and L2 writing/literacy research.

L2 writing/literacy research was soon also separated from another sister field, L1 English writing research. In his account of the decoupling of English L1 and L2 writing research in the U.S., Matsuda (1998; 1999) documents the initial links between English L1 and L2 writing practitioners at the tertiary level based on the English L1 practitioners' concern to serve all students in their classes who were not experienced in writing in English. The disintegration of those links coincided with the birth of TESOL in 1966, which underscored a perceived need for specialist (i.e., applied linguistics) training in order to teach L2 writing. Consequently, English L1 and L2 writing/reading focuses diverged. Matsuda describes the sad last meetings of the applied linguists at the Conference on College Composition and Communication (CCCC, an English L1 organization), as interest in L2 writing waned among English L1 professionals. The division of labor was symbolically completed (at least at the official macro-level) when no one attended the 1965 CCCC workshop on L2 writing, and the discouraged organizers abandoned plans for future workshops.

Most L2 literacy teachers at that time had no specific training in teaching reading or writing, and had they looked to research for insights, they would have found justification for a bottom up, sentence-level, and contrastive rhetoric orientation. Thus, L2 writing and reading continued to be taught throughout most of the 1970s with an applied linguistics (i.e., a formalist) orientation and those few who published work on L2 writing no doubt considered themselves something like applied linguists. In the meantime, however, in L1 English, research into L1 writers, texts, and composing processes (such as Emig 1971 and Shaughnessy 1977) was changing L1 English writing instruction, and a new generation of L2 writing teachers in North America, dissatisfied with what they were sensing as not a very fruitful way to teach and evaluate L2 writing at the tertiary level, soon began to turn away from a linguistic approach and look to L1 perspectives for insights. Articles by Zamel (1976) and Raimes (1979) encouraged L2 writing teachers to reject, even despise, what became characterized as an ineffective and punitive-seeming approach to L2 writing, where the focus was not on communication but on correctness and where the L2 writer was necessarily cast as deficient. L2 writing teachers were exhorted to become writing teachers, not language teachers (aka, applied linguists), who were stigmatized as excessively, even exclusively focused on structure and error. In the new process approaches imported into L2 from L1 writing instruction, language concerns were grudgingly addressed almost as an afterthought only at the end of the writing process. Applied linguistics became, and for many remain, tainted with the stain of the old error-focused approaches.

Throughout the 1980s, L2 writing researchers became increasingly aware of how much was at stake in teaching/learning L2 writing. Of all the language skills or functions, only writing creates a product that can be examined independent of the physical presence of the L2 learner, disclosing student vulnerabilities that can easily remain hidden in L2 reading, for example (Leki 1993). The potential serious risks for the L2 writer may be at the core of the contentiousness that has characterized L2 writing research over the last 15 years. Although at first, the points of contention appeared to be various pedagogical issues, since the beginning of the 1990s, the debates have taken an ideological turn, starting with Santos' (1992) description of the L2 English writing profession as resolutely non-ideological compared to English L1 *because of* its roots in applied linguistics, and with Canagarajah's (1993) criticism of L2 writing researchers for not addressing ideological questions. Since that time, among L2 writing researchers, debates on such topics as EAP (Allison 1996, Benesch 1996, and Pennycook 1997), critical pedagogy (Benesch 1993), voice (Ramanathan and Kaplan 1996 and Raimes and Zamel 1997), individualism (Ramanathan and Atkinson 1999), and plagiarism (Pennycook 1994a) have been distinctly ideological.

Despite spirited and convincing depictions of mainstream applied linguistics (Grabe 1994, Grabe and Kaplan 1992) as drawing on many social-science traditions, recent criticisms of applied linguistics, from within the discipline itself, also seem to home in on perceptions of narrowness and failure to see research issues as embedded within broader educational, sociocultural, and ideological frames. As Pennycook (1996b) comments:

> One of the areas in [sic] which TESOL/applied linguistics has been slow to acknowledge as a fast-moving, fascinating, contentious, and "happening" area of research and speculation is in literacy. Whereas work around L2 literacy continues by and large to focus on the mechanics of reading and writing, a large body of work has focused on literacy within a far broader social and political context, viewing literacy as a social practice, as a central part of how we read the world, and as connected therefore to cultural frameworks and political access (1996b:163).

Literacy as social practice might here be juxtaposed against the idea of writing as "technology," which appears to represent a more mainstream applied linguistics view of writing (Grabe and Kaplan 1996). That applied linguistics continues a focus on "the mechanics of reading and writing" whereas L2 writing and literacy work has become more interested in literacy as social practice is perhaps materially seen in the fact that relatively little writing research appears in the main applied linguistics periodicals and much of what does appear could be characterized as quantitative in its methodologies. In fact, even the ideologically aware work of the genre researchers in Australia that Pennycook was reviewing in the citation above has offered until quite recently a relatively mechanical, overly simple answer to questions of empowerment through literacy: a relentless focus on genre, a form of literacy study which is seen, and sees itself, as squarely situated at the core of applied linguistics.

Lazaraton (1998) further notes that, despite a sense among some that applied linguistics is moving from "an essentially unquestioned reliance on and preference for quasi-experimental studies employing parametric statistics in the 1980s, to a broader, multidisciplinary perspective on research methodology, as well as the nature of research itself, in the 1990s" (1998:3), applied linguistics periodicals, except for the *TESOL Quarterly*, do not reflect this change. "From 92 percent to 97 percent of the articles [in the three journals she reviewed besides the *TESOL Quarterly*] are quantitative in nature" (p. 3), a state of affairs that might in part be a cause of "...our increasingly pointed questions about the significance of our [applied linguistics] research (e.g., Rampton 1997)" (1998:3).

The pointed questions clearly suggest a dissatisfaction with the traditional applied linguistics paradigm and perhaps ways to break out of it. Larsen-Freeman (1997) sees in applied linguistics "a certain turmoil, a field in search of a new paradigm" (91), and McGroarty (1998) urges applied linguistics to take a lesson from what she calls the "constructivists" and include in its formulations greater awareness of the constructed nature of knowledge. In other words, L2 writing and literacy researchers who are dissatisfied with applied linguistics are not alone.

With these contested characterizations of applied linguistics in mind, I would like to propose three key areas in L2 writing/literacy research which are likely to be influential into the next decade. Some of this work draws fairly directly on applied linguistics traditions; some of it, on the other hand, might usefully contribute to alternative perspectives in the move to "postmodernize" applied linguistics. Finally, I will note areas where applied linguistics traditions might enhance L2 writing/literacy research.

Because *ARAL* regularly reviews current work in L2 language teaching, rather than repeat the material in its 1998 volume, I refer readers to excellent review articles by Hudson and Cumming covering theoretical perspectives in reading and writing, Bamford and Day (reading) and Raimes (writing) on teaching, and Perkins (reading) and Kroll (writing) on testing. In proper postmodern fashion, in this review I do not claim to cover the range of contributions to L2 writing/literacy research in some objective way that would somehow capture all its multiple facets. Nor can I feel confident that my choices would be those of others involved in L2 writing/literacy research. Rather I embrace the position that the perspective apparent in my choices here, as well as the views expressed, is contingent, dynamic, and necessarily limited by my own situatedness as an L2 writing researcher in North America.

NEEDS ANALYSIS

Within education more generally, and so also within applied linguistics, traditional needs analysis explores the context for literacy acquisition by examining the target. Genre studies overlap with needs analysis through their attempt to describe target texts (Swales 1990), although researchers like Berkenkotter and Huckin (1995), as well as Swales (1990) and Johns (1997), also situate genres within social contexts and as a response to them. Contrastive Rhetoric too is often a form of needs analysis, anathema to some L2 writing researchers because of its propensity to essentialize cultures (see discussion of identity, below), partly through its static representation of their written products and its implication that L2 writers too are little more than products of a static culture (see, for example, Kubota 1997; 1999). While Contrastive Rhetoric has become more subtle and its analyses more sophisticated and sensitive in its later years (Connor 1996), Scollon (1997) suggests that Contrastive Rhetoric is a misnomer since Contrastive Rhetoric has in fact never really engaged in a rhetorical analysis which would focus on persuasion and so encompass an analysis of audience. Such an analysis would of necessity include more sensitivity to context, and to shifting contexts, which would likely loosen the stasis of simply comparing one set of textual patterns to another, which Scollon terms contrastive poetics.

Within the context of academic writing, needs analyses like Leki and Carson (1994) and Carson, *et al.* (1992) attempt to determine the kinds of literacy demands L2 writers face at the tertiary level, presumably to then create L2 literacy classes more responsive to those needs. A very positive feature of these investigations is their inclusion of students' own views on their needs through surveys and interviews. However, needs analysis of this kind has been subject to cogent criticism by Benesch (1993; 1996), who in effect asks whose needs are actually served by the more traditional needs analyses and proposes, instead, a consideration of the broader political issues that created the "needs." In her analysis, for example, cutbacks in funding for education at her institution resulted in larger classes which, in turn, resulted in L2 learners having a more difficult time following a psychology professor's lectures. A traditional needs analysis would have led to the students being offered extra work on, perhaps, listening comprehension or vocabulary. In the critical needs analysis Benesch describes, it is the large class sizes and funding cutbacks that need to be addressed. The economic and political context, not the students, is the problem.

But problematizing traditional views takes other angles as well. Ramanathan and Kaplan (1996), for example, question the usefulness of the unexamined transfer from L1 to L2 writing instruction of the highly prized concept of voice. Similarly Atkinson (1997) deconstructs the notion of critical thinking in relation to L2 learners. (See also three responses to Atkinson by Davidson [1998], Gieve [1998], and Hawkins [1998].) In fact, the whole notion of literacy in L1 or L2 as an unblemished good has been severely challenged in several quarters (Grabe and Kaplan 1996, Purcell-Gates 1998, Street 1993, Stuckey 1991). In L2 settings, this negative perspective on literacy has dovetailed with Phillipson's (1992) applied linguistics work on linguicism and Pennycook's (1994b) challenge to the view that the acquisition of English worldwide is a neutral act, disengaged from political exigencies.

Within the L2 writing classroom, arguably the most potent aspect of the context for learning is the writing teacher's response to the students' writing. Ferris' (1997) and Ferris, *et al.*'s (1997) detailed studies of both L2 writing students' responses to teachers' markings and the revisions that subsequently resulted are important and extremely useful works, with direct applications to classroom teaching. But in a less traditional applied linguistics mode, and in keeping with recent moves toward seeing more closely the humans who are the central actors in L2 literacy acquisition (and toward the growing consciousness of the complex variability across these humans and over time), Hyland (1998) and Severino (1993) use qualitative and context-sensitive research methodologies which counterbalance the inadequacies of a more distanced, and more generalizable, approach. In Hyland's (1998) case study of two L2 writers in New Zealand, we meet Samorn, who requested of her writing teacher a particular focus on grammatical errors but who (unrecognized by the teacher) became increasingly discouraged when her teacher in fact did as she asked. Severino (1993), on the other hand, demonstrates three different approaches (encouraging resistance, accommodation, or assimilation) she used in a writing center to respond to differing needs of three students. We see from this work that "needs" are complex, difficult to sort out, and may require a variety of responses.

Like the Ferris/Hyland/Severino explorations, particularly useful to developing an understanding of the intersection of theoretical issues, historical forces, and students' lives are combinations of studies that illuminate these intersections from different points of view. Pennycook's (1996a) historical examination of plagiarism in the Western literacy tradition and Currie's (1998) naturalistic study of one student's use of plagiarism to help her get through her course work at a Canadian university, mutually illuminate the terrain, grounding theoretical discussion in a real life.

Finally, from applied linguistics' traditional domain of error correction, Truscott (1996) reviews the published research and comes to the rather untraditional conclusion that error correction is probably useless and potentially harmful to L2 writing students. Here too, although Truscott does not pursue the angle, what is at issue is needs analysis, but no longer constructed as the mold into which students must be squeezed by instruction. What is implied in a rejection of error correction is that there is room for differential attainments at differential speeds.

Thus, the traditional domain of needs analysis, coming from education and overlapping in a variety of ways with applied linguistics research, has become more complex with the realization of competing needs and vested interests in defining and meeting those needs.

IDENTITY

A second theme of recent L2 writing/literacy research that will surely be expanded upon in the coming decade is related to identity issues. Identity "...will be a preoccupation in any period of intense change..." (Fairclough 1997:14) and probably becomes a particularly contested terrain whenever an individual moves into any new context. In a special issue of the *TESOL Quarterly* guest edited by Norton (1997) and devoted to L2 learner identity, Thesen (1997) calls into question critical discourse analysis of individuals as the hapless sites of struggles of competing discourses (although Critical Discourse Analysis has recently incorporated a greater interest in identity as well; see Fairclough 1997). With her intention to emphasize individual human agency in these struggles, her in-depth interviews with a group of students in South Africa show how multiple home literacies inform the development of academic literacy in play with the learners' strategic positioning of themselves in relation to the dominant target (here academic) discourse. The learners are central actors. They actively engage in calculating and manipulating just how far they want to go in pushing a particular identity for themselves. Ivanic (1998) too describes an adult learner who intermingles both active resistance to and acceptance of a particular kind of literacy (academic) in favor of another kind (professional) even within the same text, underscoring the hybridity of both texts and identities. These kinds of studies, because they are sensitive to context, work to complicate views of learners and work against the kind of essentializing that has been noted, sometimes vehemently, as a danger in cross-cultural studies. (See for example, Kubota 1997; 1999, Spack 1997c, Susser 1998; see also Atkinson, to appear, for a response.)

One potentially fruitful but underrepresented type of study is in-depth interviews and observational investigations by researchers who speak the same language as the research participants. Riazi (1997) explores the initiation of a group of Farsi-speaking graduate students into discourse and literacy demands of a Canadian college of education, and Kanno and Applebaum (1995) interview Japanese speaking students on their experiences of marginalization in a Canadian high school. Further such studies conducted in students' L1s can be anticipated and will be welcome.

In addition to examining others' identities, a perhaps growing trend has been to examine one's own identity conflicts both as a literacy learner (Bell 1995) and as a literacy teacher (Spack 1997b, Vandrick 1997). Studies like these potentially offer rich and intimate perceptions.

LONGITUDINAL STUDIES AS EXTENSIONS OF IDENTITY WORK

Portrayals of individuals' struggles with L2 literacy are greatly enhanced, as well as less liable to the dangers of overly simple cultural explanations of behaviors, when studies are conducted over time, allowing investigators and readers to see transitions to and shifts among different identities in response to different environmental pressures. Although such research is time consuming, a bank of studies focusing on real students, with names, over time, is developing (Mlynarczyk 1998, Smoke 1994).

Harklau's (1999; in press) study of four students' experiences in a U.S. high school poignantly describes their transition from being considered model students (obedient, quiet, respectful, cooperative) in high school to being labeled, instantly upon moving into tertiary education, ESL students, their whole identities summed up in their writing and language skills. We also see the teachers' misguided attempts to draw on the experiences of the students in the ESL writing class by encouraging them to contrast their experiences in the U.S. with their experiences at home. For Harklau's four students, home was the U.S.; they had no real experience of their previous residences to draw on, but by repeatedly pointing them toward those residences, their teachers constructed them as outsiders they did not feel they were.

Spack (1997a) follows the on-going development of academic literacy for a Japanese college student. Initially ascribing her difficulties to some sort of Japanese approach to education, this student comes to see and demonstrate her own multiple literacies reinforcing and interweaving with each other as she confronts a variety of literacy demands in college.

My own (Leki 1999) five-year study of the literacy experiences of a Polish-speaking student shows dramatically how his educational experiences, first in a U.S. high school and then in a university, served to create an approach to education that might be called self-defeating or perhaps opportunistic. As the student, Jan, struggles to negotiate what he increasingly intensely comes to see as meaningless institutional obstacles, he cynically learns to play whatever game it takes to pass courses.

While studies like these can be extremely illuminating, they inevitably entail serious issues of representation as students' identities are created in the text for readers by researchers. The constructed nature of knowledge is most easily apparent in such studies and, it is to be hoped, promotes sensitivity to the constructed nature of all forms of knowledge, including quantitative work. (See Mortensen and Kirsch 1996 for enlightening reflections on the ethics of reporting on in-depth studies.)

Oddly underrepresented in longitudinal research are in-depth, over-time studies of students' experiences in L2 literacy classes themselves, which would focus not on increased control over the language but on the whole experience—the interaction with other students, with the material, and with the teacher. We get a glimpse of one such set of experiences in Malicka (1996), where students' initial enthusiasm for the L2 writing course changed to boredom and irritation, changes the teacher remained unaware of. (See Villalobos 1996; also see Toohey 1998 for an example with 5-7 year olds.)

APPLIED LINGUISTICS' CONTRIBUTIONS TO L2 LITERACY RESEARCH

While mainstream applied linguistics itself has lamented the overrepresentation of English and monolingual English-speaking countries in its work, writing research probably suffers from this flaw even more so. Silva, Leki, and Carson (1997) chide L1 academic literacy researchers for their ethnocentric discussions of writing theories and processes, universalizing Western literacy contexts, and basing their conclusions about writing on the experiences of 18 year old U.S. college students. They also assert that L2 studies can offer L1 academic literacy studies access to an expanded universe of literacy development (see also Muchiri, *et al.* 1995). But in fact, L2 literacy studies, like applied linguistics, are also far too English oriented. Clearly material conditions of scholarship that Canagarajah (1996) discusses play a role in creating the lopsided overemphasis on English from monolingual English-speaking countries. But mainstream applied linguistics, particularly in its consideration of language planning issues, has a great deal to offer literacy studies, helping to develop in literacy investigators a sense of the international contexts for literacy development both in L1 and L2. Parry and Su's (1998) book, for example, consists almost entirely of student-written explorations of literacy issues in China and combines information on language policy and planning with these graduate students' reflections on their own experiences as language learners and English teachers in technical training schools.

Efforts like the special issue of the *Journal of Asian Pacific Communication*, guest edited by Kaplan (1995), and devoted to literacy and language planning in countries of the Pacific rim, and Brock and Walter's (1993) volume also focusing on that part of the world, need to be expanded and supplemented with information from additional areas of the world and with more grounded descriptions of students' actual experiences. Dubin and Kuhlman (1992) represents an effort in this direction as does Purves' (1992) IEA study, one in reference to which Cumming and Riazi (1996) feel more L2 literacy researchers need to position their own work.

Finally, more traditional mainstream work in applied linguistics continues to bring detailed insights into writing processes (Roca de Larios, Murphy and Manchon 1999, Zimmermann in press), focusing particularly on how and when L1 is tapped during L2 text production. In spite of such progress, however, Cumming and Riazi (1996) remind us that we are as yet still in the embarrassing situation of having no suitable model for inquiry to inform educational practices, including writing instruction.

CONCLUSION

Parks and Maguire assert that in applied linguistics, context has been "evoked but not explored" (1999:144). It seems reasonable to expect that the next decade will bring about greater attention to the multiplicity and complexity of literacy acquisition, at least partly through more detailed, "thicker" descriptions of individual acquirers within specific and carefully specified contexts: These descriptions should include both immediate contexts of educational settings and personal histories (where, it is to be hoped, the voices—the words—of these acquirers will be heard much more than they have been to this point) as well as more distanced contexts of social, cultural, economic, political, and ideological environments. (See Pennycook 1997 and Benesch 1996 for discussions of excessively limited ideas about context.)

The acquisition of literacy, like the acquisition of English, is risky, and not an implicitly beneficial or even neutral undertaking. While education by its nature inevitably entails change, obviously not all change brought about by education is for the benefit of everyone. Some are left behind and excluded from political power and a variety of social and material benefits, often on the basis of differential literacy acquisition. Initiation into the literate worlds of alien cultures and technologies can also, for example, promote education in and knowledge about inappropriate technologies, ones that may be useful in the metropolitan countries of origin but (imported into non-urban countries by their own educated elite and oriented toward concerns of the center) are useless to the periphery. This type of change creates societies that are made "...permanent parasites on the developed countries for knowledge and information..." (Pattanayak, p. vi, cited in Pennycook 1994b:21). Literacy acquisition can also create disjuncture between individuals' local or home culture and their new literate or academic culture. Maintaining a critical awareness of the dangers of literacy activities, that is, holding carefully and reflectively in mind the political and power-relation consequences of literacy activities means, as has been said many times before in the critical pedagogy literature, asking fundamental questions: Why are these people learning to read and/or write this language? What are they giving up? Who stands to benefit? Who will lose?

It seems essential that new applied linguists be carefully and thoroughly acquainted with the various critical discourses that probe and contest otherwise unexamined meaning-making structures like classrooms and educational institutions. The spread of English and the spread of literacy cannot be assumed to be benign. Without such exposure to critical discourses, applied linguists will be in unconscious complicity with the status quo, in effect, working to reproduce unjust social, economic, and political arrangements. Since the discourses that reproduce such structures are readily available (Pennycook 1997) and therefore tempting, and since the discourses that work against reproducing those structures are far less available and are often difficult to understand, an essential role for senior applied linguists is to help expose future applied linguists to contestatory discourses and, if necessary, help demystify the sometimes dense language that can discourage novices and lead to their dismissal of these points of view.

While I earlier characterized debates surrounding academic literacy issues as contentious, it is to be hoped, nevertheless, that debate can continue but also that the most powerful voices will not drown out or silence quieter contributions in pursuit of a single correct outlook. (See Belcher 1997 on the issue of nonadversarial argumentation.) While I am not suggesting some neoliberal acceptance of everyone's happy voices and native costumes, like biodiversity, ideational diversity permits the mutations that create new questions and options, and that, in turn, can lead toward a desirable "pluralisation of knowledge" (Pennycook 1997:263).

NOTES

* I would like to thank Dwight Atkinson for his challenging and insightful reading of this manuscript.

1. I am indebted to Linda Harklau for sharing her insights on this point with me. Although SLA has drifted away from the core of applied linguistics to follow an independent course with somewhat different preoccupations (Grabe and Kaplan 1992), its interest in oral forms remains influential in applied linguistics more generally.

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For readers wishing a lucid introduction to the project of critical pedagogy, Benesch offers a clear and compelling example from her own writing class. Although thoroughly grounded in theoretical issues, Benesch's account avoids the dense theoretical language of critical work, making her account accessible even to newcomers.

Harklau, L. In press. From the "good kids" to the "worst": Representations of English language learners across educational settings. *TESOL Quarterly*. 34.

Harklau offers a moving and convincing portrayal of a group of students in transition between high school and college in the U.S. whose identities are

actively constructed for them by the institutions in which they find themselves. The construction of these students as foreigners, though well-meaning, contradicts and undermines their own developing sense of themselves as complex individuals and cultural hybrids.

Ivanic, R. 1998. *Writing and identity.* Philadelphia: J. Benjamins.

Through extensive interview and textual analysis, Ivanic explores the case of a writer between identities: her personal sense of herself as a budding social worker and an academic identity being pushed upon her as a student. Here again the account is eminently readable yet clearly conversant with pertinent theoretical issues.

Mortensen, P. and G. Kirsch. 1996. *Ethics and representation in qualitative studies of literacy.* Urbana, IL: National Council of Teachers of English.

This collection of reflections reporting on qualitative research cuts to the core of what it means to represent someone else publically in writing (and profit by it, if only in terms of professional esteem and promotion). It raises concerns about colonizing the other, confronting research participants with negative evaluations of themselves, and a number of other provocative issues.

Norton, B. (ed.) 1997. *Language and identity.* [Special issue of *TESOL Quarterly.* 31.3.]

This special-topic issue touches on a number of questions related to how identities are constructed and reconstructed through the process of language learning.

Pennycook, A. 1996a. Borrowing others' words: Text, ownership, memory and plagiarism. *TESOL Quarterly.* 30.201–230.

Pennycook offers here an example of the kind of work applied linguists might do that would work toward critical perspectives on teaching and research in L2 writing contexts. L2 professionals are called upon to see themselves as the cultural workers that they are and to embrace that identity through efforts such as this one, whose project is to demystify the unexamined assumptions in the West about plagiarism, that greatest of literary sins, which nevertheless has thrived throughout Western academic and literary life.

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DESIGN AND PRACTICE: ENACTING FUNCTIONAL LINGUISTICS

James R. Martin

LINGUISTICS AS SOCIAL ACTION

I have tried to practice linguistics as a form of social action, a practice which Halliday (e.g., 1985) has suggested cannot be other than ideologically committed. This practice dissolves the linguistics vs. applied linguistic opposition which has evolved in response to the hegemony of American formalism—whose idealizing reductivity comes nowhere near serving the needs of language users and their aids around the world. In its stead, linguistics as social action engages theory with practice in a dialectic whereby theory informs practice which, in turn, rebounds on theory, recursively, as more effective ways of intervening in various processes of semogenesis are designed (Martin 1997; 1998a). My own experience of this engagement has been mainly in the field of literacy, especially of writing development in primary and secondary school. Accordingly, I'll draw on this experience to address the sub-field 'Writing and Literacy,' writing as a linguist working across what is generally read and has been increasingly institutionalized as an applied vs. theoretical frontier.

WRITING DEVELOPMENT

The transdisciplinary literacy research to which I am referring evolved as an action research project in and around Sydney from 1979 (reviewed in Christie 1992, Cope and Kalantzis 1993, Martin 1993; 1998b, Rothery 1989; 1996), involving at key stages the Linguistics Department at the University of Sydney and the Metropolitan East Region of the New South Wales Disadvantaged Schools program. Our goal, as educational linguists, was to intervene in the process of writing development in primary and secondary school across various depths of time. As far as logogenesis was concerned, we attempted to provide students with knowledge about language (Carter 1996) that they could use in reading, writing, and editing. As for ontogenesis, we worked with teachers on the design of curriculum (learner pathways) and pedagogy (classroom activity). Finally, with respect to phylogenesis, we were committed to a redistribution of literacy resources and critical language awareness (Fairclough 1992) which we hoped would emancipate the meaning potential of the students we were working with, with a view to giving them ways of redesigning their world. To date, we have had some impact on the first two of these frames for intervention; only time will tell the extent to which the work has been socially empowering for the non-mainstream students involved.

To inform our interventions, we drew on the functional model of language in social context evolving around the work of Halliday (1994), especially the notion of genre (Martin 1992).[1] Genre was used to redesign both curriculum and pedagogy. As far as curriculum was concerned, we worked in secondary schools for example, to map disciplines as systems of genres (e.g., Coffin 1996; 1997, Veel and Coffin 1996 for secondary school history). From these maps, we developed learner pathways[2] as a guide for moving students through the uncommon sense discourses of the discipline. Our secondary school history pathway is outlined in Table 1.

The pathway begins with various recount genres designed to reconstruct personal and vicarious experience; it moves on through genres concerned with explaining cause and effect; it continues with argumentative genres; and it culminates with Foucauldian genealogy. (The general stages in each genre are indicated in brackets.) One critical factor in this development is the mobilization of grammatical metaphor (Halliday 1994; 1998, Halliday and Martin 1993, Martin 1993, Martin and Veel 1998)--resources for nominalizing processes, qualities, and modal assessments and resources for realizing logico-semantic connections inside the clause. Our work in this project convinced us that learning to read and write discourse heavily dependent on grammatical metaphor was the main linguistic task for teachers and students in secondary school; it is through grammatical metaphor that every discipline and institution we considered evolves the discourses which construe specialized knowledge and regulate populations (Christie and Martin 1997).

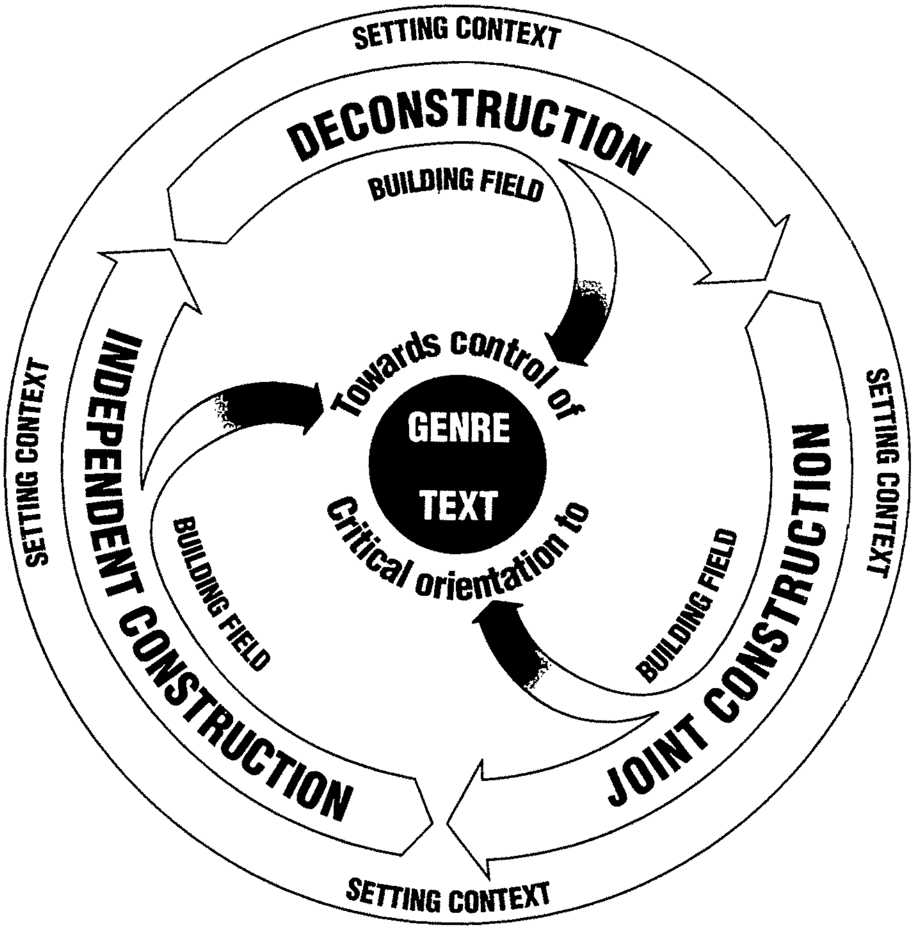
GENRE [staging]	INFORMAL DESCRIPTION	KEY LINGUISTIC FEATURES (Halliday 1994, Martin 1992)
personal recount [Orientation^Record]	agnate to story genres; what happened to me	sequence in time; 1st person; specific participants
autobiographical recount [Orientation^Record]	borderline - agnate to story & factual genres; story of my life [oral history]	setting in time; 1st person; specific participants
biographical recount [Orientation^Record]	story of someone else's life	setting in time; 3rd person (specific); other specific & generic participants

historical recount; [Background^Record]	establishing the time line of the grand narrative	setting in time; 3rd person; mainly generic participants (but specific great 'men')
historical account; [Background^Account]	naturalizing linearization rendering the grand narrative inevitable	incongruent external causal unfolding; 3rd person; mainly generic participants; prosodic judgement
factorial explanation [Outcome^Factors]	complexifying notion of what leads on to/from what	internal organization of factors; factors externally linked to outcome; 3rd person; mainly generic participants
consequential explanation [Input^Consequences]	complexifying notion of what leads on to/from what; hypothetical variant - if x, then these outcomes	internal organization of factors; consequences externally linked to input; 3rd person; mainly generic participants
exposition - one-sided; promote [Thesis^Arguments]	problematic interpretation that needs justifying	internal conjunction keying on thesis
challenge - one-sided; rebut [Position^Rebuttal]	someone else's problematic interpretation that needs demolishing	internal conjunction keying on thesis
discussion - multi-sided; adjudicate [Issue^Sides^Resolution]	more than one interpretation considered	internal conjunction keying on thesis; + internal organization of points of view
deconstruction [Foucault]	avoiding reductive temporal & causal linearization into grand narrative, effacing voices of the 'other'...	replace naturalizing time/cause explanation with 'spatial' discursive formation realizing episteme

Table 1: Learner pathway for secondary school history genres (by genre [including staging] and language features)

As for pedagogy, in order to provide the scaffolding needed to move learners along pathways of this kind, a teaching/learning cycle was developed, and refined for secondary school along the lines of Figure 1 (from Rothery and Stenglin 1994:8). In this model, setting up the social context of the genre and building field-knowledge are generalized across all stages of the model (Deconstruction, Joint Construction, and Independent Construction). The point of this cycle is to emphasize the instrumentality of shared understandings about disciplines/institutions in their cultural contexts for scaffolding to proceed effectively (Martin 1998b). In order to establish effective zones of proximal development, in other words, the knowledge that teachers and students can all assume is vital.

Figure 1. A teaching/learning cycle for secondary school (from Rothery and Stenglin 1994:8)



In addition, the goal of the model is explicitly oriented to both control of, and a critical orientation to, the discourse under consideration. This goal reflects a concern that genres be taught as part of a critical language awareness program (Fairclough 1992, Hasan and Williams 1996) which gives students opportunities to critique and renovate genres alongside mobilizing them to interrogate power relations in the culture (Christie and Misson 1998).

Bernstein's work on pedagogic discourse (Bernstein 1990, Christie 1998) provides a model for considering this pedagogy in relation to alternative positions in their idealized form, as reviewed for *ARAL* in Martin (1993).

Janks (in press) suggests a comprehensive framework for assessing language in education interventions of this kind, organized around the issues of access, dominance, diversity, and design. In relation to genre-based initiatives, *access* focuses attention on the extent to which pedagogy and curriculum redistribute control of genres to non-mainstream groups. *Dominance* deals with issues of power—which genres are selected, how critically is their social function addressed? *Diversity* considers the range and hybridity of subjectivities involved in institutional learning, for example, divergent orientations to literacy, and the problem of valuing non-mainstream discourses at the same time as offering access to mainstream ones. *Design* takes up the question of creativity and innovation: Does renovation indeed depend on mastery of a genre, and how do we provide opportunities for students to rework genres in line with their interests and goals? Our experience is that the approach to curriculum and pedagogy outlined above is flexible enough to address issues of this kind (Callow 1999). Naturally, some measure of redesign is to be expected as it is recontextualized in new social environments, for example, the challenge of reconstruction in South Africa, as outlined by Janks.

BEYOND GENRE

Functional linguistics is concerned with relating language to the social in a motivated way. The utility of genre theory in language education derives from its articulation as recurrent configurations of meanings, so that the social (genres) can be naturally related to language (meanings). Interventions in Australia have tended to move into education from the genre, and then move on to look more closely at meaning as resources permit. Underpinning genre with functional grammar has turned out to be a vexing political issue, with the print and electronic media and politicians voicing a variety of reactionary concerns (see Martin 1997 for discussion). And not much progress has been made with bringing discourse analysis (e.g., cohesion, following Martin 1992) and register analysis (e.g., Christie and Martin 1997, Eggins and Slade 1997, Martin and Veel 1989) into schools by way of mediating the connection between grammatical meaning and genre. Clearly, the next phase of intervention will have to address the problem of constructing functional grammar, discourse analysis, and register analysis as tools for teachers and students to use when relating language to the social, whether as part of literacy programs, or as subject-specific learning across the curriculum. Hasan's elaboration of Bernstein's work on coding orientations (e.g., Hasan 1996) will also have a critical role to play, especially in relation to Janks' diversity issue noted above.

Strong contributions are also to be expected in the area of evaluative language (Martin 1999b on appraisal), where frameworks have now been developed that systematically account for the construction of value in texts. This focus on attitude (embracing affect, ethics, and aesthetics) helps balance the ideational bias which often colors discourse analysis, especially where factual writing is concerned. It also calls into focus the issue of subjectivity and reading position, since evaluative language is so patently sensitive to class, gender, ethnicity, and generation; as such, it provides additional scope for incorporating critical language awareness into language-in-education programs (as encouraged by the various papers in Fairclough 1992).

Alongside appraisal, multimodal text analysis is generating considerable interest (following Kress and van Leeuwen 1996, van Leeuwen 1999). Callow (1999) shows how a concern with both the verbiage and the image can be incorporated in various ways into the primary-school curriculum. Once we add sound and music to the picture, then a rich framework for considering texts from a wide range of registers inside and outside the school is enabled. One of the intriguing developments in this work has been the use of image analysis as a way into the analysis of language, especially functional grammar. The pedagogical implications of this reorientation should be a fertile area of Australian action research in the next decade.

Alongside the expansion of resources for analysis, new sites for intensive intervention seem to be emerging as we struggle to rebuild our post-colonial world. One Australian site has to do with English literacy for indigenous people; Brian Gray, Wendy Cowey, and David Rose are currently developing relevant curricula and pedagogy as part of a well-funded federal initiative, initially in South Australia (Gray and Cowey 1999). The South African challenge of providing access to education to the 'lost generation' is also of immense significance (Hart 1999). I would expect these sites of reconstruction and reconciliation, and related sites around the world, to pose challenges for the dialectic of theory and practice in language education. The dialectics will reshape our conception of what language education is about and how educational linguistics can help out.

DIALOGUE

We have been asked to comment on obstacles to our field (by the editor), and I can sum up my perspective in this regard around the theme of dialogue. For linguistics as social action to be effective, it has to evolve—to be recontextualized in relation to new problems and in relation to informing theories (Martin 1998a). To get this kind of dialectic working, we have to communicate across frontiers, as part of transdisciplinary initiatives. Based on past experiences, an interdisciplinary endeavour is unsatisfactory. Dividing up a problem so that it can be addressed by different theories doesn't encourage the dialogue we need. Rather, we need to move beyond difference towards overlapping and intruding expertise (Martin 1997). In Australia, for example, our efforts thrived in proportion to the amount of linguistics our educators could learn, and the amount of educational theory and practice our linguists could absorb. We tried to develop a linguistic theory of learning (genre-based pedagogy) and a linguistic theory of knowledge (genre-based curriculum); or, turning this around, we had to reconceive language development as pedagogy and social context as curriculum for purposes of institutionalized learning.

Looking forward (Wells 1994), ideal partners in a transdisciplinary dialogue of the kind I have in mind here would be systemic functional linguistics (SFL) and neo-Vygotskyan learning theory (the Mind, Culture, and Activity group [MCA] anchored by Cole and Wertsch). The SFL community starts with language and tries to interpret activity, image, and sound as meaning; the MCA group starts with action, and tries to interpret language as activity (with genres as cultural artifacts for example; Kamberelis and Bovino 1999). SFL and Critical Discourse Analysis (CDA) would also be promising partners. To the extent that regionality, technicality, and power-infested human foibles of various kinds discourage dialogue of this kind, then, to that extent, the evolution of linguistics as social action will be impeded—at the expense of those it is trying to serve. I see the lack of dialogue as our major obstacle.

The emergence of the field of applied linguistics itself is a major problem in this regard, since it symbolizes the alienation of formal linguistics from the needs of the community. I personally find it hard to imagine how a centripetal formalist linguistic discourse, however hegemonic it now appears, can withstand the marketing pressures of economic rationalism. For me, it puts the discipline of linguistics itself at risk—leaving it perhaps to applied linguists to rebuild departments a generation hence. This dialogic gulf is fraught with challenges and needs to be faced by linguists looking back to the examples of Fries and Pike and Firth for inspiration so that some disciplinary reconciliation might get under way (a kick-start is probably overdue).

One final obstacle I would like to highlight, concerns the lack of what I call positive discourse analysis (Martin 1999c). By this, I mean discourse analysis, however informed, which focuses on social change and how it comes about. It seems to me that we have no end of critical discourse analysis which focuses on power and how it oppresses. What we are lacking is a complementary focus on how social subjects design change—how Mandela and the ANC achieved their goals, how feminists have renovated our world, how Irish Catholics in Australia mobilized across social class, and so on. If we understood change for the better, then we could use these understandings to inform our interventions in whatever practice is undertaken. We could stop being so monologically depressing all the time when talking about language and power. More Foucault please, complementing Gramsci. We need to take heart in pursuit of our ideals.

METALANGUAGE

I also would like to comment on the training and development of future generations. I have strong views in this regard, and they run against the grain of current practice, which tends to emphasize eclecticism. This practice seems to be driven by the idea that no single theory can serve all needs; and so practitioners need to take a little speech act theory here, a little conversation analysis there, some critical discourse analysis here, a little variation theory there, some language acquisition here, a little gender analysis there...until a range of pressing problems are somehow addressed. The problem with this catholic approach is that applied linguists end up as pidgin speakers of a range of theories, with theory so divorced from practice that any possibility of creolization is pretty much foreclosed. For eclecticists, the possibility of a genuine theory/practice dialectic is simply out of reach. Ultimately, this approach de-professionalizes the applied linguistics community as a whole.

Alternatively, perhaps complementing eclecticism, we could encourage the institution of a metalinguistic *lingua franca*, a common theoretical language shared across the community for purposes of working together on problems and feeding practice back into theory. For this investment to be worthwhile, the theory selected will have to repay the costs of both its technicality and the boundaries it places on what can be thought. In this regard, we should perhaps recall Kenneth Pike and the development of tagmemics in relation to bible translation around the world. Two critical properties of Pike's designs were (i) extravagance (a model of language in relation to a unified theory of the structure of human behavior), and (ii) fractality (redeployment of theoretical concepts across levels and modalities).

Currently, the model which most clearly partakes of these properties and which is already emerging as a *lingua franca* for discourse-oriented applied linguistics is Systemic Functional Linguistics, as developed by Halliday and his colleagues around the world. The best resourced part of this framework is Halliday's functional grammar (1994), which I would therefore recommend as part of the training and development of future applied linguists. The concepts on which this grammar is based are mobile ones, and can be redeployed across languages (Caffarel, *et al.* in press), across levels (including phonology, discourse, and context), and across modalities (including image, sound, music, and action). The model has also proven itself to be a practical one, regularly redeployed across an expanding range of practices (e.g., language teaching, forensics, museology, psychosis, computational linguistics, and so on; see Unsworth 1999.) Over time, I believe, the cost of learning the new terminology and theoretical design of SFL can be repaid.

In our post-Fordist information society, training has to include re-training: Pre-training is simply an initiation into a lifetime of in-service education. This expectation puts an additional pressure of adaptability on any *lingua franca* we promote. Future applied linguists need a flexi-theory they can adapt to new concerns; pre-training can't cover all contingencies, and it's just too costly to learn a new theory on the go for each new job.

Alongside SFL, how many serious contenders do we have for the *lingua franca* that I think we need? If none, why none? How can we encourage their development if SFL isn't up to the job?

Developing an adaptive framework for applied linguistics is one great challenge for a new millennium! The other great challenge, along with keeping their own house in order, is that applied linguists will have the job of resuscitating linguistics as a discipline—one with a more socially responsible role to play in a post-colonial, post-modern world.

NOTES

1. Our social perspective on genre evolved from 1980 in ways that resonate with work by Berkenkotter and Huckin (1993), Kamberelis and Bovino (1999), Miller (1984), Russell (1997), and Swales (1990); the development of the model is reviewed in Martin (1999a).

2. We would not argue that every student follow this pathway precisely, but we would point out that genres further along tend to presuppose resources in preceding genres and that this meaning potential has to be developed in other ways if the genres in question are in some sense 'skipped.'

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LANGUAGE POLICY AND LANGUAGE ASSESSMENT

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LANGUAGE POLICY AND PLANNING

Sauli Takala and Kari Sajavaara

INTRODUCTION

The field of language policy and planning is clearly a sub-field within applied linguistics. It generally does not draw heavily on formal linguistics, except for aspects of corpus and status planning. However, it does draw extensively from a range of disciplines in order to plan, implement, and evaluate language policies that respond to the needs of stake holders of various types. Despite continuous development of the field, aspects of language policy and planning need to be developed further. One of the key areas where policy can be enhanced considerably is in the area of policy and planning evaluation. This direction of inquiry is also relevant to a number of other areas within applied linguistics.

In the present article, we will be concerned primarily with foreign language planning, that is, planned changes in foreign language instructional systems and in uses of languages in different social contexts (with special reference to the Nordic and Baltic countries). These planned changes may result from language policy decisions by relevant authorities and institutions. We have also chosen to focus, in particular, on the relationship between language planning and evaluation. The article will close with brief summaries of language policy developments in Nordic and Baltic countries.

At the outset, it should be pointed out that language planning decisions and language policies are not the only reason for the growth of a nation's total language capital. There are at least three more general reasons for such growth. First, globalization has resulted in an increased need and use of foreign languages. The most important factors include internationalized labor markets, communication media, internet, data banks, various types of international collaboration, foreign trade, and professional needs and training. It is quite evident that a fair amount of this activity centers around a small number of major languages, primarily English. For example, globalization of various industries and foreign trade has meant that many companies have adopted English as the language of their internal communication. A number of institutions have had a direct impact on the need and use of foreign languages. In Europe, the most important of these is the European Union, which has eleven official languages. This setting means that less widely used languages, such as Finnish for instance, have been assigned unprecedented functions in European community activities.

Second, explicit decisions by public authorities or various types of institutions have resulted in changes in policies. In 1995 in its White Book, the European Union, for instance, adopted an objective according to which all European citizens should learn at least two European languages in addition to their mother tongues. In Finland, such a decision was made in connection with the introduction of the Comprehensive School system in the early 1970s: All comprehensive school pupils have to study, in addition to their mother tongues, the other national language of the country and a foreign language. This language policy decision was not derived from language planning considerations; it was an outcome from a purely political deal between representatives of the Finnish Cabinet and the party representing a Swedish speaking minority in Finland. Similarly, all Finnish university graduates have to pass a test in the non-native domestic language which authorizes them to function as civil servants in bilingual areas in Finland. In this institutional category, we could also include various European Union exchange and cooperation programs which result in raised levels of foreign language competence through increased cross-language interactivity. This emphasis on bilingualism is an institutionalized counterpart to migration due to, for instance, unemployment, poverty, and restricted human rights.

Third, language capital is increased through people's private decisions to travel and migrate without any intervention by authorities. Tourism and employment abroad often result in prolonged interaction with speakers of other languages and in steady interest in other cultures, which may be a source of a more profound motivation to learn the languages concerned

It is obvious, however, that language policy and planning efforts have become increasingly institutionalized activities because, as noted by a Finnish language planning committee in the early 1990s, political conflicts/issues can often be simultaneously language conflicts/issues and political conflicts/issues.

ISSUES IN LANGUAGE POLICY AND PLANNING

Applied linguistics has incorporated language policy and language planning as one of its many domains. The *Annual Review of Applied Linguistics* has made a valuable contribution by taking up the theme regularly (together with issues of bilingualism and multilingualism) in several volumes (at least in Volumes 2, 6, 10, 14, and 17). There have also been important pioneers in this field, including Haugen (1966), Kloss (1969), Tauli (1968), and Fishman (1974), to mention only a few prominent scholars. However, the field is not yet well-established and needs further development. It is posited here that language policy and language planning should, more systematically than in the past, draw on the work of policy studies in general and forge closer links with evaluation. It is argued that good planning needs good evaluation to inform it.

Planning can take many forms. Common sense suggests that some planning is better than other planning and some plans better than others. This raises the question of *criteria* that can be properly used to evaluate planning and plans. It is not possible to elaborate on this topic here. It can only be briefly noted that criteria involve at least the following four issues: 1) the set-up of the planning system (stakeholder perspective); 2) the principles, values, and procedures applied during planning (e.g., equality, fairness, factual and comprehensive data, hearing of experts); 3) public review and discussion of plans; and 4) adequate monitoring and evaluation of plan implementation and of potential unplanned (and undesirable) side effects.

Planning can take place in a variety of settings. One possible way of looking at the situation is a typology suggested some thirty years ago by Thompson and Tuden (1959). Parties involved may either agree or disagree on facts and on values. If there is agreement on values and facts, programmatic plans/decisions can be made, basically in a bureaucratic structure. This is hardly a common situation, however, as far as language policy and planning is concerned. If there is agreement on values but not on facts, pragmatic plans/decision can be made, often in a collegial structure. If there is agreement on facts but not on values, bargained plans/decisions can be made in a representative structure. If there is no agreement on either values or facts, plans/decisions are largely ad hoc in an anomic structure.

Another aspect worth considering—as implied by Kaplan (1994), for example—is to try to proceed from country and regional analyses to "universal" analysis in order to discover similarities and differences, leading to useful typologies and—perhaps ultimately—universal principles. In fact, Kaplan, in collaboration with Baldauf has recently made considerable progress in this direction in the recent volume, *Language planning: From practice to theory* (1997), which represents a major contribution to the field of language policy and planning. The comprehensiveness of the book in terms of content and literature covered deserves acclaim.

In planning, a general distinction should be made between strategic planning and operational planning. Main tasks in strategic planning are problem analysis, stakeholder analysis, analysis of objectives, analysis of inputs, analysis of external influencing factors, and analysis of the responsible organizations (e.g., Dale 1998). Operational planning consists of the formulation of a detailed guide for implementation. This requires an elaboration of more specific objectives, procedures, tasks, time scales, and budgets.

LINKING LANGUAGE PLANNING AND EVALUATION

The consequences of plans and their implementation need to be evaluated. Planned and systematic action presupposes that evaluation is an inherent part of it. The plan itself can be critically examined in terms of appropriate criteria. The implementation of the plan can be monitored on a continuous basis for information needed for follow-up purposes. This is called formative evaluation. At the point where the plan needs to be more systematically reviewed, summative evaluation is needed (Scriven 1967).

Language planning can be carried out more or less explicitly or implicitly, but always draws on prior activities and prior views. Language planning means making decisions. It requires monitoring to determine the impact of the decisions. In order to progress as a form of social activity, language planning needs conceptual frameworks to advance professionalism in the domain. What is said above suggests that a possible framework is one which links decisions and monitoring in a systematic manner. The literature of program evaluation contains several models (Shadish, Cook and Leviton 1991), but the model presented by Stufflebeam (1975) is one that does this more systematically than any other model. Consequently it will be used as the organizing framework for the following discussion. The purpose is to explore the feasibility of the model in the domain of language planning. The original model is presented in Table 1.

	INTENDED	ACTUAL
ENDS	PLANNING DECISIONS Supported by CONTEXT EVALUATION	RECYCLING DECISIONS Supported by PRODUCT EVALUATION
MEANS	STRUCTURING DECISIONS Supported by INPUT EVALUATION	IMPLEMENTING DECISIONS Supported by PROCESS EVALUATION

Table 1: The CIPP model of evaluation (Stufflebeam 1975, Stufflebeam, *et al.* 1971)

The acronym CIPP comes from the initial letters of four types of evaluation: context, input, process, and product. From the decision-making point of view, a corresponding acronym PSIR might be derived to reflect the four types of decision: planning, structuring, implementing, and recycling.

Briefly stated, context evaluation serves planning decisions to determine aims. Input evaluation serves structuring decisions to determine program designs. Process evaluation serves implementing decisions to control program and project operations. Finally, product evaluation serves recycling decisions to judge and react to program and project attainments.

In the CIPP model, context evaluation is the most basic kind of evaluation. Its purpose is to provide a rationale for determining objectives. In the domain of language planning, this evaluation would include careful definition of the relevant language community, description of the desired and actual conditions pertaining to the language environment, identification of unmet needs and unused opportunities, and diagnosis of the problems that prevent or interfere with the fulfilment of needs or restrict the full use of existing opportunities. The diagnosis of problems provides an essential basis for developing objectives whose attainment will result in improved language policies.

The CIPP model suggests that context evaluation begins with a conceptual analysis to identify and define the limits of the domain to be served as well as its major subparts. This view seems to apply also to language planning quite well. Next, empirical studies—surveys and other types of research—are carried out to identify unmet needs and unused opportunities. Then context evaluation involves both empirical and conceptual analyses, as well as appeal to theory and authoritative opinion, to aid judgements on the basic problems which must be solved. According to Stufflebeam, identification of the problems to be solved is equivalent to identification of the objectives to be achieved. In language planning, the situation is seldom so straightforward.

In the CIPP model, the purpose of input evaluation is defined as the provision of information for determination of the kind and amount of resources needed and the manner in which they will be utilized to achieve program and project objectives. In language planning, this would mean identification and assessment of: 1) relevant capabilities of the responsible agency, 2) strategies for achieving planned objectives, and 3) designs for implementing a selected strategy. Alternative language planning options are assessed in terms of the following:

1. their resource, time, and budget requirements;
2. their potential procedural barriers;
3. the consequences of not overcoming these barriers;
4. the relevance of the designs to project objectives; and
5. the overall potential of the design to meet project objectives.

Stufflebeam sees this information as essential in program evaluation, and this view seems to be relevant also for language planning.

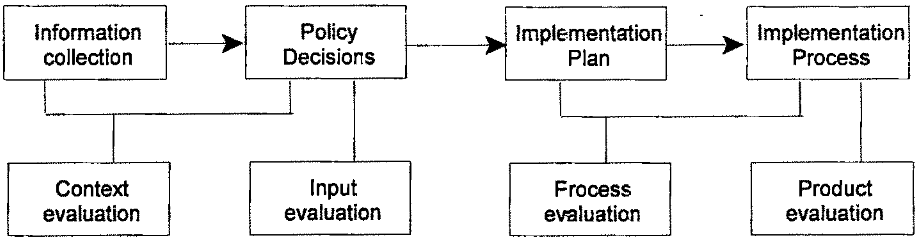
Stufflebeam suggests that input evaluation can vary from highly structured to quite informal procedures. In language planning, common practices would include committee deliberations, professional literature, interest-group submissions and reports, and the experiences of other countries/contexts. Pilot experiments in a limited number of contexts may even be carried out. Major changes in language policy normally require extensive efforts to provide the information which is not available but needed if projected objectives are to be attained.

When the implementation of the new language plans has begun, process evaluation is needed to provide periodic feedback to persons responsible for implementing plans and procedures. This kind of evaluation has three main functions: 1) to detect and predict defects in the procedural design or its implementation during the implementation stages, 2) to provide information for future decisions, and 3) to maintain a record of procedures as they occur.

Finally, product evaluation is intended to measure and interpret outcomes not only at the end of a program or a project cycle but as often as necessary during the process. In language planning, this evaluation would mean a major review of the state of achieved language planning goals.

As language policy and planning literature has long recognized, there are several actors with a stakeholder interest in the activities to be carried out (see Haugen 1966, Ingram 1989, Kaplan and Baldauf 1997). Kaplan and Baldauf present a comprehensive view of the theme and summarize their discussion in a very illuminating figure (1997:6) which posits national resource development planning as the overarching concept, dividing it into natural resource development planning and human resource development planning. Under the latter is placed language planning and other planning, and language planning is elaborated further to include government agencies, education agencies, non/quasi-governmental organizations, and other organizations. Each of these elements is specified in some detail. Figure 1 relates the basic language planning model of Kaplan and Baldauf to the CIPP evaluation model.

Figure 1. Basic language planning model in relation to an evaluation model (adapted from Kaplan and Baldauf 1997 and Stufflebeam, *et al.* 1971).



In the following Tables (2 and 3), the same conceptual approach is applied, relating the CIPP model to decisions and evaluations made by various stake holders. This mapping is an attempt to test the feasibility of the model in the context of language planning and policy.

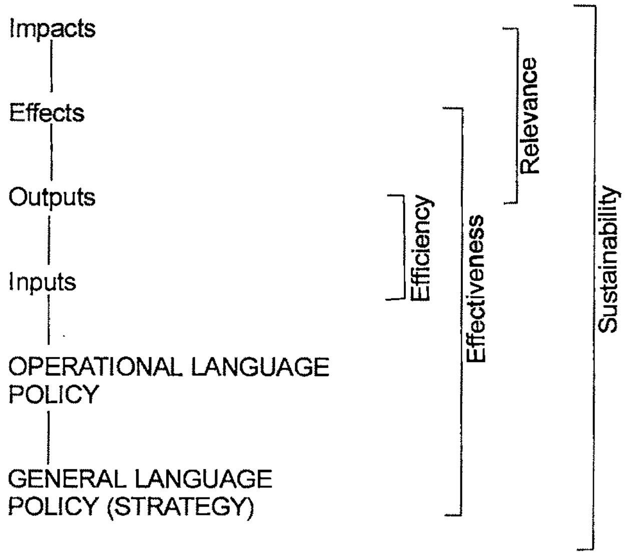
Level of decision making	Types of decision			
	Context	Input	Process	Product
Individual - Parents - Minors - Adults/citizens	Individual language goals, language choices	Decisions concerning individual input in terms of - Time - Energy - Investment	Decisions concerning how individuals monitor their progress toward individual goals	Decisions concerning how individuals assess outcomes in terms of individual goals
Associations/ organizations, interest groups	Group's language goals	Decisions concerning group's support for goal attainment	Decisions concerning how group monitors progress toward the group's goals	Decisions concerning how group assesses outcomes in terms of its goals
Local government	Language planning goal at the local level	Decisions concerning local input for goal attainment in terms of - facilities - staff - programs	Decisions concerning how local government monitors progress toward its language planning goals	Decisions concerning how local government assesses outcomes in terms of its goals
Regional government	Language planning goal at the regional level	Decisions concerning regional support for goal attainment in terms of - facilities - staff - programs	Decisions concerning how regional government monitors progress toward its language planning goals	Decisions concerning how regional government assesses outcomes in terms of its goals
National government	Language planning goal at the national level	Decisions concerning national support for goal attainment in terms of - facilities - staff - programs	Decisions concerning how national government monitors progress toward its language planning goals	Decisions concerning how national government assesses outcomes in terms of its goals
Supranational agencies	Declarations/ recommendations on goals	Recommendations on input	Recommendations on process monitoring	Recommendations on how to assess outcomes of recommended goals
Research community	Critical analysis of plans and goals	Critical analysis of the planned input	Critical analysis of the planned process	Critical analysis of the planned product

Table 2: Types of decisions related to levels of decision making (stakeholders)

Level of decision making	Types of evaluation			
	Context	Input	Process	Product
Individual - Parents - Minors - Adults/citizens	Survey of goals	Survey of what goal achievement presupposes of individuals - Time - Energy - Investment	Survey of how progress toward individual goals is made	Survey of outcomes in terms of individual goals
Associations/ organizations, interest groups	Analysis/ critique of current goals, proposals, expert goal discussions	Survey of the goal attainment conditions of the group	Survey of how progress of the relevant group is made	Survey of outcomes in terms of the group's goals
Local government	Survey of the local situation, local language plans	Survey of what the attainment of goals imposes on local - facilities - staff - programs	Survey of how progress toward local goals is made	Survey of outcomes in terms of local language planning goals
Regional government	Survey of the regional situation, regional language plans	Survey of what the attainment of goals imposes on regional - facilities - staff - programs	Survey of how progress toward regional goals is made	Survey of outcomes in terms of regional language planning goals
National government	Survey of the national situation, national language plans	Survey of what the attainment of goals imposes on national - facilities - staff - programs	Survey of how progress toward national goals is made	Survey of outcomes in terms of national language planning goals
Supranational agencies	Declarations/ recommendations on goals	Recommendations on input	Survey of how progress toward recommended goals is made	Survey of outcomes in terms of recommended language planning goals
Research community	Critical analysis of the actual context	Critical analysis of the actual input	Critical analysis of the actual process	Critical analysis of the actual product

Table 3: Types of evaluation related to levels of decision making (stakeholders)

Figure 2. Language policy in an evaluation framework (adapted from Dale 1998).



The evaluation perspectives can vary in terms of their scope (e.g., Dale 1998, Scheerens and Bosker 1997) (see Figure 2). *Efficiency* is usually related to how productively the inputs (resources) have been converted into outputs (results). *Effectiveness* is a broader concept and has to do with the extent to which the planned outputs, immediate objectives, and long-term impacts are achieved. *Relevance* addresses the question of how the high priority goals of key stakeholders/beneficiaries are being met (e.g., Nikki 1992). Impact refers to longer-term, largely indirect, consequences of the plan/program for the intended beneficiaries and for societal change in general. *Sustainability* has to do with how the planned (and hopefully achieved) improved state of affairs can be maintained.

A BRIEF LOOK AT THE NORDIC AND BALTIC REGION

In the following sections, we will discuss briefly some recent developments in Scandinavia and the Baltic. The discussion is related to recent language policy documents prepared and adopted under the auspices of the Council of Europe, which has a long and recognized role in issues related to human rights and language rights. The discussion is purposefully limited to the Nordic and Baltic regions to highlight the current, dramatically different, situations in two adjacent regions.

1. The Nordic states

In July 1999, the Swedish Government submitted a proposal to the parliament concerning measures that needed to be taken for Sweden to be able to ratify the Council of Europe Framework Convention for the Protection of National Minorities (approved and opened for signatures on February 1, 1995). This proposal would mean that Swedish national minorities and their languages are recognized and that the minority languages will be given the support they need to stay alive. The groups covered by the proposed law are the Sami people, Swedish-Finns, Tornedal-inhabitants, Romanis, and Jews. The minority languages are Sami, Finnish, Meänkieli (Tornedal-Finnish), Romani chib, and Yiddish. Of these languages, Sami, Finnish, and Meänkieli are recognized to possess a historical geographical basis, which means that they are entitled to broader support than the other languages. In practice, this designation has to do with the right to use these three languages in court and in administrative matters in those areas where the languages have been traditionally used and are still widely used. The bill is proposed to take effect in April, 2000.

More generally, the European Framework Convention entered into force on February 1, 1998 when it was initially ratified by twelve countries. The countries that were among the first to ratify the convention were: Austria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Germany, Hungary, Italy, Liechtenstein, Macedonia, Malta, Moldavia, Norway, Rumania, Russia, San Marino, Switzerland, Slovakia, Slovenia, Spain, The Ukraine, and the United Kingdom.

The European Charter for Regional or Minority Languages, open for signatures since November 5, 1992, took effect on March 1, 1998 when five countries initially ratified it. Among the first countries to have ratified it were Croatia, Finland, Germany, Hungary, Liechtenstein, The Netherlands, Norway, and Switzerland. Norway was actually the first to ratify the minority language charter. The only minority language mentioned is Sami and it applies to the approximately 35,000 Sami-speaking citizens. The Norwegian language groups were not eager to be labeled minorities in the manner specified in the earlier convention, and thus, this document has not been ratified for them. Its principles are, however, adhered to by Norway.

In Finland, national minority language legislation traditionally covers Swedish (1922) and Sami (1992). Finland ratified the Charter on Regional or Minority Language as the second country in 1994 (and also ratified the Framework Convention in 1997). Finland has ratified the Framework Convention for Sami, Swedish, Romani, and other non-territorially bound languages, following consultation with the recognized bodies representing these language groups. This wording also means that Finland may later decide to award minority language status to other languages. Groups to be consulted would represent Jews, Tatars, and "old Russians."

In Finland, the current language laws stem from 1922 (based on paragraph 14 of the 1919 constitution). It designates Finnish and Swedish as national languages, and it requires that they and their speakers are treated with full equality (a revised constitution is expected to take effect in early 2000) . Other laws specify, for instance, the language requirements for various categories of civil servants. There have been complaints that practice does not always correspond to the principles as far as the Swedish speaking minority is concerned. The Ombudsman of the Parliament has issued a statement in which the complaint is confirmed and the Cabinet Office has reminded the various ministries about the obligations of the language laws. A government committee has been appointed recently to draft the new language laws and related legislation. The new laws are expected to be in effect not later than in four years.

Denmark ratified the Framework Convention in 1997. It applies to the German-speaking minority in Southern Jutland. Denmark did not ratify the Charter on Regional or Minority Language at the same time.

2. The Baltic states

The Baltic States were independent from 1918 to 1940. Before the First World War they had a mixed history of German, Swedish, Polish, and Russian rule and influence. From 1944 to 1991 they all were under Russian rule.

The language policy developments in the Baltic States after the collapse of the Soviet Union are a good example of how the ethnic constitution of the population, in addition to the past history of the country, can be reflected in language attitudes and decision-making. The three Baltic States—Estonia, Latvia, and Lithuania—have adopted policies that differ from each other and are directly dependent on the proportion of the non-local population in each country.

In all three states, the language legislation is basically the same, with the local majority language being the state language, obliging state employees to use the language for their services. Yet Lithuania, where only one fifth of the population is non-Lithuanian, has adopted practices which give less emphasis to the promotion of the state language than the ones in use in Latvia and Estonia, where two fifths of the population are non-local. Interestingly, the attitudes of the Latvian population have gradually become stricter, where the non-local population has been more willing to learn the state language than in Estonia.

Before World War II, the Baltic States had their own school systems, cultural organizations, publications, and other elements of cultural autonomy. During the Soviet period, a Leninist principle of the equality of languages was originally adopted, which was also meant to solve the problem of illiteracy. At the same time, however, Russian was promoted as a language of wider communication and international contacts, while the national language was considered a communication instrument and not an integral element of identity. Russian was gradually given more emphasis, and a special kind of idea of bilingualism was developed through the introduction of the concept of *Homo Sovieticus*. Gradually, particularly during the Brezhnev years, the use of the local language became restricted: Services in Russian were to be available throughout the Soviet Union and local people were expected to comply with this requirement.

After the Baltic States gained their new independence in 1991, new legislation was developed which was fully implemented at a rather rapid pace. Generally speaking, the new laws included the following provisions: The local language was to be the official state language, which meant that all state operations and various other uses of language, such as signing, names, etc., were to be in the official language. Staff employed by the state were to be able to use the national language. Citizenship was acknowledged only for people who were citizens in 1940 and their descendants.

Language requirements were also imposed on citizenship. Naturalization was made possible on the basis of time of residence and demonstrated competence in the official language of the country. The national language requirement has an impact on the status of speakers of Russian. In the early 1990s, the percentages of monolingual Russian speakers were high in all of the three states, and national language requirements excluded many of them from citizenship.

Latvia: At present, the largest proportion of non-local population lives in Latvia. In 1998, out of the 2.43 million inhabitants, a total of 647,000 (24 percent) are non-citizens, which means that 76 percent of the total population are citizens. A total of about 400,000 of the citizens are of non-Latvian origin, that is, persons who have passed the tests for naturalization. The 1989 language law set rules for the use of the Latvian language in state institutions, corporations, educational establishments, and public meetings. Language inspectors were appointed who had the right to fine persons in breach of the rules. A new stricter law was adopted by the Latvian parliament in 1998, adding self-employed persons to the list of those who have to use the state language. If a foreign language is used at meetings, the organizers have to provide translation into the state language. This law applies also to private enterprises and meetings held at the workplace. Codification of the Latvian language has been given an important role: New terms can be used only after they have been approved by a state terminology commission. The new law was not accepted by the Latvian President, one of the reasons being the fact that the law did not sufficiently promote the inclusion of national minorities into Latvia's society, so it was sent back to the parliament for reconsideration.

As many as 90 percent of the non-Latvians believe that it is very important or fairly important for Latvian residents to know Latvian well. Between 1992 and 1997, a total of 388,000 people passed the Latvian language proficiency examinations administered by the State Language Centre. The development of the Latvian language test for citizenship purposes has drawn largely on the work done under the Council of Europe auspices (e.g., the Threshold concept), and the development teams have been consulting several European institutions with recognized expertise in testing and assessment.

Estonia: Estonia's population is slightly less than 1.5 million. Non-ethnic Estonians constitute 37 percent of the total population, approximately 28 percent being ethnic Russians. According to Estonian legislation, state employees have to be proficient in Estonian. A fairly large number of state employees have been dismissed since the law took effect in 1993. If inhabitants are in a district where more than one-half of the population speak a language other than Estonian, they are allowed to receive information in that language and the local government can conduct business in that language. From 1999, knowledge of the Estonian language is obligatory for all state, municipal, and other functionaries and for people who work in the area of public services. Estonia emphasizes an integration program. Its objective is to cut down the number of people with undetermined citizenship, step up the teaching of Estonian, and increase non-Estonians' participation in Estonian society. All persons resident in Estonia are allowed to vote in local elections, but only Estonian citizens can stand as candidates. Russian language schools will be discontinued from 2000. Only 42 percent of those who were naturalized between 1992 and 1996 have passed the language examination. According to the present legislation, naturalization without Estonian proficiency is no longer possible. Children born in Estonia after 26 February 1992 have been granted an easier access to citizenship. Between 1992 and 1998, a total of 103,000 persons were naturalized.

Lithuania: In Lithuania, 80 percent of the population of 3.72 million are Lithuanians, and only 20 percent represent minorities, the largest being Poles (9 percent) and Russians (8 percent). The Lithuanian language is the state language, and it is to be used in the activities of state and public bodies, as well as in educational, cultural, scientific, industrial, and other institutions, enterprises, and organizations. State employees have to be proficient in Lithuanian. Lithuanian authorities have indicated that no one should be dismissed solely because of an inability to meet the language requirement. It is to be considered a moral incentive for people to learn Lithuanian. The 1991 Lithuanian law on nationality has made it possible for the authorities to grant citizenship to all persons resident in Lithuania, regardless of their origins, previous residence, or ability to speak Lithuanian. Some 90 percent of persons belonging to the minorities have Lithuanian citizenship. There are no plans to constrain education in minority languages, and in higher education, minorities have been given their own quotas.

THE OUTLOOK

As has been suggested in this survey, we believe that systematic effort should be taken to develop professionalism in the area of language policy and language planning. The dawn of the new millenium seems to be a particularly opportune moment to reflect on the new challenges that are facing us. Reference has already been made to the importance of linking planning and evaluation—they are like two sides of the same coin. Those involved in language policy and language planning could pursue the disciplinary development of evaluation by seeking to establish it as a distinct academic sub-field with its own degree programs or perhaps as joint degree programs that utilize the potential of the Internet, preparing, as a joint effort, standards for the practice of language policy making and language planning. There exist standards for evaluation of educational programs, projects, and materials which are continuously revised to reflect changes in the discipline. The evaluation standards cover four broad areas: utility standards, feasibility standards, propriety standards, and accuracy standards. The first three would be quite relevant also for language policy and language planning.

In the spirit of the present article, it is suggested that there should be systematic attempts to monitor and evaluate the efficiency, effectiveness, impact, relevance, and sustainability of language policies and plans. Another area of study would involve the critical study of public discourse and debate on language policy and planning.

A desirable development would also include a tradition of recurrent regional and international conferences and seminars on language planning. The authors of this article contributed to arranging one such conference and the experience was both useful and rewarding. Hopefully, joint conferences would lead to joint studies by international teams of experts.

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Baker, C. and S. Prys Jones. 1998. *Encyclopedia of bilingualism and bilingual education*. Clevedon, UK: Multilingual Matters.

This is a comprehensive volume that covers a range of issues on bilingualism. It deals with individual bilingualism, bilingualism in society, languages in contact, and bilingual education. There is also a chapter on bilingualism and language policies. The volume is unquestionably a major contribution to the field of bilingualism.

Cenoz, J. and F. Genesee (eds.) 1998. *Beyond bilingualism: Multilingualism and multilingual education*. Clevedon, UK: Multilingual Matters.

This edited book of twelve articles incorporates a multilingual perspective and looks at multilingualism from both a global and an individual perspective. It also examines educational implications of multilingualism, presenting six case studies in multilingual education.

Kaplan, R. B. and R. B. Baldauf, Jr. 1997. *Language planning: From practice to theory*. Clevedon, UK: Multilingual Matters.

This important book deals with key concepts and issues in language planning, presenting a general framework for planning. The ambitious aim of the book, as the title suggests, is to make a contribution to the theory of language planning. It does this by conceptualizing language planning in terms of key elements and issues. Several case studies in language planning are also presented. The book should be required reading for all engaged in language policy and language planning.

Lambert, R. D. (ed.) 1994. *Language planning around the world: Contexts and systemic change*. Washington, DC: National Foreign Language Center.

The papers in this volume deal with recent planned changes in the foreign language instructional systems of a variety of countries (the Netherlands, Sweden, Finland, England, Israel, and Australia) and address problems and prospects for planning in the American context. In most of the countries covered, the language planning issues address concerns at the national level, and the value of learning foreign languages is unquestioned. In the United States, in contrast, the minimal planning that exists takes the form of dispersed isolated decisions. The themes that recur in the volume include: 1) differences in the context on planning, 2) recommendations for change in specific features of the language-instructional system, and 3) the process of planning and systemic change.

McKay, S. L. and N. H. Hornberger (eds.) 1996. *Sociolinguistics and language teaching*. Cambridge: Cambridge University Press.

This edited book contains highly informative articles by a number of well-known scholars. Sections deal with language and variation, language and interaction, language and culture, and there is a chapter specifically on language and education. In the section on language and society, there is a 45-page article on language planning and policy by Terrence G. Wiley. Among several topics covered, the discussion of various approaches to language planning in particular stands out as a valuable contribution.

Paulston, C. B. and D. Peckham (eds.) 1998. *Linguistic minorities in central and eastern Europe*. Clevedon, UK: Multilingual Matters.

This edited volume, of great topical interest, contains an integrating introduction by Paulston and ten case studies. The case studies cover a wide geographic region: Austria, minorities in the Balkans, Bulgaria, the Caucasus, the Czech Republic, Hungary, Latvia, Romania, Russia, and Slovakia.

Sajavaara, K., R. D. Lambert, S. Takala and C.A. Morfit (eds.). 1993. *National foreign language planning: Practices and prospects*. Jyväskylä: Institute for Educational Research, University of Jyväskylä.

This collection of papers originated from a conference that brought together experts on foreign language teaching and learning from North America and from western, central, and eastern Europe. It focuses primarily on a comparison across countries and continents of the domains, directions, and processes of language planning. The papers provide both a sense of national differences in the contexts in which language planning is carried out and an in-depth analysis of particular substantive domains relating to language planning such as language choice, teacher training, and assessment. A number of domains of language policy in which the Europeans and Americans have relevant experience are identified, and it is hoped that these domains provide useful guidance for future planning.

Schiffman, H. E. 1996. *Linguistic culture and language policy*. London: Routledge.

This book is a strongly culturally-anchored view of language policy. It represents a systematic approach to analyzing language policies and presents several typologies that implement this view. It also presents detailed analyses of language policies in different parts of the world. The discussion on the language policies in France may be singled out as presenting new and interesting reflections.

Spolsky, B. and E. Shohamy. 1999. *The languages of Israel: Policy, ideology and practice*. Clevedon, UK: Multilingual Maters.

The authors of the book provide a thorough and timely analysis of the linguistic scene and linguistic policy in the truly multilingual state of Israel. The authors note that the book appears close to two anniversaries: just over 100 years since the decision to revive Hebrew was made and 50 years since the establishment of the state of Israel and its policy to maintain Hebrew and Arabic as official languages and languages of instruction. The book describes and analyzes the developments during the half century up to the present time, including the 1995–96 Policy for Language Education. It gives a thoughtful appraisal of the developments and the current state and prospects of true linguistic diversity. The book is a valuable and welcome contribution to the rapidly evolving field of language policy studies.

Wodak, R. and D. Corson (eds.) 1997. *Encyclopedia of language planning and education. Volume 1: Language policy and political issues in education.* Dordrecht: Kluwer Academic Publishers.

This edited volume contains a number of articles, each about ten pages in length. Five articles deal with theoretical issues; another five address minorities and education; eight articles present language policy in various countries and regions; and five articles address practical and empirical issues. One unifying feature of the articles is that they discuss future directions in the areas covered.

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ASSESSMENT AND TESTING

Caroline Clapham

INTRODUCTION

In this brief article, I discuss the relationship between language testing and the other sub-disciplines of applied linguistics and also the relationship, as I see it, between testing and assessment. The article starts with a brief exploration of the term 'applied linguistics' and then goes on to discuss the role of language testing within this discipline, the relationship between testing and teaching, and the relationship between testing and assessment. The second part of the article mentions some areas of current concern to testers and discusses in more detail recent advances in the areas of performance testing, alternative assessment, and computer assessment. One of my aims in this article is to argue that the skills involved in language testing are necessary not only for those constructing all kinds of language proficiency assessments, but also for those other applied linguists who use tests or other elicitation techniques to help them gather language data for research.

APPLIED LINGUISTICS AND THE ROLE OF ASSESSMENT

It is usually the case with new disciplines that they go through periods of adjustment as the limits of the discipline are realigned. Applied linguistics is going through such a stage at present as its scope widens and its subfields start to impinge on those of other disciplines.

The term 'applied linguistics' appears first to have been used in the late 1940s when the discipline embraced the teaching and learning of second and foreign languages (Johnson and Johnson 1998), but since then the discipline has expanded to cover a wider range of sub-disciplines or 'subfields' as they are called by Bachman and Cohen (1998). In 1980, Henry Widdowson said, "...applied linguistics yields descriptions which are projections of actual language which explore linguistic theory as illumination..." (p. 169), and in 1997, Chris Brumfit defined applied linguistics as "...the theoretical and empirical investigation of real-world problems in which language is the central issue" (p. 93). (See also Ben Rampton's [1997] introduction to the special issue of *Applied Linguistics* in which Brumfit's article appeared; this issue of *Applied Linguistics* focused on the concept of 'applied linguistics.')

In 1999, Richard Hudson, in an e-mail to the LAGB (Linguistics Association of Great Britain) listserve, said:

> The main distinguishing characteristic of AL (Applied Linguistics) is its concern with professional activities whose aim is to solve 'real-world' language-based problems, which means that research touches on a particularly wide range of issues—psychological, pedagogical, social, political and economic as well as linguistic. As a consequence, AL research tends to be interdisciplinary (Hudson 1999).

Language assessment plays a pivotal role in applied linguistics, operationalizing its theories and supplying its researchers with data for their analysis of language knowledge or use. It has itself become a sub-discipline of applied linguistics, which is in some ways unfortunate, since it is has tended to become compartmentalized (Bachman and Cohen 1998) and does not interact as much as it should with the other sub-disciplines. Bachman and Cohen (1998) decry the compartmentalization of second language acquisition (SLA) and language testing, saying that most mainstream researchers in the two sub-disciplines are unaware of research taking place in the other. However, they hope that this lack of awareness may now be changing. (For other discussions of the relationship between testing and SLA, see Shohamy 1998, Upshur and Turner 1998.)

A key point, which perhaps not all applied linguists appreciate, is that language testing is by no means limited to assessing the linguistic proficiency of L2 students. Many areas of linguistic research use elicitation instruments to gather data, and these instruments often take the form of tests or tasks (see, for example, Robinson 1997, Skehan and Foster 1999). If the results of such data elicitation techniques are to be credible, they need to be prepared with as much rigor as proficiency tests, and they therefore have to be valid and reliable (Alderson and Banerjee in press). Crudely, a valid elicitation technique is one that accurately elicits what it is intended to elicit, and a reliable technique is one that produces consistent results. (For discussions of validity, see Chapelle 1999, Messick 1989; 1996, Shepard 1993; and for comments on the relationship between validity and reliability, see Moss 1994.) Although Messick (1989) subsumes reliability under validity, since any valid measure must, by definition, be reliable, it is useful here to distinguish between validity and reliability since the assessment of an instrument's reliability is often neglected in elicitation procedures. If research is to have credibility, data gathering instruments must not only be carefully designed to ensure that they will elicit the type of language required, they must also be pre-tested to check that the measures do indeed elicit such language practice and that any rating or coding system is workable and capable of producing consistent results (see North and Schneider 1998). Since it is generally expected that subjects in an investigation produce similar kinds of language regardless of when the task is done, and that this language can be analyzed in a similar manner regardless of when and by whom it is assessed or coded, the reliability of the elicitation techniques must be given careful consideration.

ASSESSMENT AND LANGUAGE TEACHING

There has been much discussion about how language testing fits into applied linguistics and how it relates to language teaching (see, for example, Bachman and Palmer 1996). In general, it seems clear that "...language testing benefits from insights from applied linguistics as a discipline..." (Alderson and Clapham 1992:164) but that it is sometimes necessary for testing to lead the way:

> We believe that language testers can serve linguistic theory by examining the way in which their tests work, how their different components interrelate, and what they reveal about candidates' language proficiency. Insights from such an analysis of test results should contribute to the development of a better understanding of what is involved in knowing and using language (1992:164).

It seems, indeed, that each affects the other: Methods of assessment may affect teaching in the classroom (Cheng 1997, Wall 1996; 1997), while new theories of language learning and teaching lead to changes in testing practices (Spolsky 1995).

THEORIES OF LANGUAGE TESTING

With the advent of communicative teaching in the late 1970s, there was a need for testers to devise new theories of language testing. Canale and Swain (1980), whose model applied to both teaching and testing second and foreign languages, included grammatical, sociolinguistic, and strategic competence in their description of the domains of language use. In 1990, Bachman added psychophysiological mechanisms and proposed four components in his model: grammatical, textual, illocutionary, and sociolinguistic competence. Bachman and Palmer (1996) elaborated on this model further to include both affective and metacognitive factors. Bachman and Palmer's model of communicative language ability is used as the theoretical basis for tests such as the International English Language Testing System (IELTS) test, and it provides the basis for many current research projects (e.g., Hasselgren 1998). (See McNamara 1996 for a discussion of language testing models.)

ASSESSMENT AND TESTING

The term 'assessment' is used both as a general umbrella term to cover all methods of testing and assessment, and as a term to distinguish 'alternative assessment' from 'testing.' Some applied linguists use the term 'testing' to apply to the construction and administration of formal or standardized tests such as the Test of English as a Foreign Language (TOEFL) and 'assessment' to refer to more informal methods such as those listed below under the heading 'alternative assessment.' For example, Valette (1994) says that 'tests' are large-scale proficiency tests and that 'assessments' are school-based tests. Intriguingly, some testers are now using the term 'assessment' where they might in the past have used the term 'test' (see, for example, Kunnan 1998). There seems, indeed, to have been a shift in many language testers' perceptions so that they, perhaps subconsciously, may be starting to think of testing solely in relation to standardized, large-scale tests. They therefore use the term 'assessment' as the wider, more acceptable term.

Since, for the remainder of this article, I wish to comment on differing attitudes between 'testers' and 'assessors,' I shall use the term 'testers' for those who concern themselves with requirements of validity and reliability, and 'assessors' for those who are not consciously guided by such constraints. I must emphasize, though, that while I am giving the two terms distinct meanings, I do not think that there is a fundamental difference between them, and in other publications (e.g., Clapham 1997; to appear), I use the two terms interchangeably.

Unfortunately, although 'assessors' and 'testers' have the same aims, there is less dialogue than there should be between them, possibly because many of them tend to think of 'testing' and 'assessment' as being categorically different (see Hill and Parry 1994) instead of being on a continuum with at one end those 'testers' who deliver carefully validated multiple choice tests, and at the other end, 'assessors' who prepare real-life tasks for their students and candidates but who do not concern themselves with how well these tasks actually work. 'Assessors' appear to distrust extreme 'testers' because they feel that these 'testers' are so wedded to the numerical analysis of data that they are not sufficiently concerned with the content and administration of their tests. Such 'assessors' tend to be concerned that these 'tests' are not 'communicative,' and that they may lead to negative washback (Brown and Hudson 1998). In contrast, many 'testers' are concerned with the fact that, although the 'assessors'' methods of assessment may be novel and interesting, the tasks are not pre-tested to see whether they work as intended or whether the assessments can be delivered and marked in a consistent manner. In short, they distrust 'assessors' because 'assessors' do not appreciate the importance of investigating the validity and reliability of their instruments. Brown and Hudson (1998) quote Huerta-Macias (1995) who says that it is unnecessary to evaluate the validity and reliability of methods of alternative assessment because they are already built into the assessment process. Brown and Hudson make the point that it is not enough to build validity and reliability into the measures; the measures must also be trialed to see whether or not they are valid and reliable in practice. (See also Johnstone [in press] and Rea-Dickens [in press].)

Another source of distinction between 'tests' and 'assessments' is that some educators and applied linguists feel that 'high stakes' tests, which have a direct bearing on students' immediate futures, need to have validity and reliability built into them, but that 'low stakes' tests such as classroom tests, which do not have such an obvious impact on students' futures, do not (Davidson, *et al.* 1997). This division of tests into high- and low-stakes types seems to me to be misguided: Tests do not fall neatly into one or the other category. Whether a test is 'high-' or 'low-stakes' is surely a question of degree; a test may be deemed to be more 'high-stakes' than another if students' futures are more clearly at stake, but *all* tests which assess students' proficiency levels, whether in the examination hall or the classroom, are in reality high-stakes. Even if the results of a classroom test do not affect a student's immediate future, the results may become self fulfilling; for example, a student with a low score may be considered by both teacher and student to be a poor language learner, and this may have a damaging effect on the student's future performance. If students are to have an accurate idea of their proficiency, they should, where possible, be given tests which are valid and reliable. Even classroom tests, therefore, should, at least from time to time, be checked to see whether the skills being assessed are those intended, whether the marking scheme is appropriate and can be used consistently, and whether the results tally with other views of the student's proficiency.

This apparent dichotomy between 'testers' and 'assessors' has, however, become less marked as the move towards 'authenticity' (see Bachman 2000) in text and task has led 'testers' towards the increased use of performance tests. In addition, there is a trend at present, perhaps partly due to the influence of Messick (1989), for 'testers' to be more concerned with the construct validity than simply with the reliability of their measures. It is also the case, possibly due to the influence of post modernism, that many 'testers' are rejecting the positivist principle that there is an "...independently existing reality that can be discovered (or measured) using objective, scientific methods..." (Hamp-Lyons and Lynch 1998). The desire to question former 'truths' has led many 'testers' to trust standard statistical procedures less than they used to. Some 'testers' are also now expressing concerns about the ethicality of testing (see Kunnan in press).

CURRENT AREAS OF CONCERN IN TESTING

Areas that are attracting attention in the testing literature at present have, in a number of cases, been the subject of recent *ARAL* reviews. Performance testing was covered by Shohamy (1995), alternative assessment by Hamayan (1995), advances in the use of the computer for testing by Chalhoub-Deville and Deville (1999) and the interface between tasks and assessment by Skehan (1998) and McNamara (1998). Other areas of current interest include test washback

(Alderson and Wall 1993; 1996, Wall 1997) and the ethics of language testing (Davies 1997, Hamp-Lyons 1997, Kunnan in press, Norton 1997). (For more about these and other areas of current concern, see Bachman 2000, Brindley in press; see also Clapham and Corson 1997.) In the remainder of this article, I will update the *ARAL* articles on performance testing, alternative assessment, and the use of computers for testing. I will, at the same time, relate these three areas to real or imaginary differences between 'testers' and 'assessors.'

1. Performance testing

As Shohamy (1995) points out, alternative assessment and performance testing have much in common. Indeed, the major difference between the two seems to be that performance testers agonize about the validity and reliability of their instruments while alternative assessors do not (Hamayan 1995). Both, however, are concerned with asking students to create or produce something, and both focus on eliciting samples of language which are as close to real life as possible (see Kormos 1999, Lynch and McNamara 1998, Papajohn 1999, Upshur and Turner 1998). McNamara (1996) states that a defining characteristic of performance testing is that "the assessment of the actual performances of relevant tasks are required of candidates, rather than the more abstract demonstration of knowledge, often by means of paper-and-pencil tests" (McNamara 1996:6; see also McNamara 1997). The same could well be said of methods of alternative assessment.

2. Alternative assessment

'Alternative assessment' is one of the terms used to refer to informal assessment procedures such as those often used in the classroom. Typical examples of such methods involve portfolios (Hamp-Lyons 1996), learner diaries or journals (Genesee and Upshur 1996), and interviews with teachers (Genesee and Upshur 1996). Such procedures may be more time-consuming and difficult for the teacher to administer than 'paper-and-pencil' tests, but they have many advantages. They produce information that is easy for administrators, teachers, and students to understand; they tend to be integrated; and they can reflect the more holistic teaching methods being used in the classroom (Hamayan 1995). A problem with methods of alternative assessment, however, lies with their validity and reliability: Tasks are often not tried out to see whether they produce the desired linguistic information; marking criteria are not investigated to see whether they 'work'; and raters are often not trained to give consistent marks (see Brown and Hudson 1998). As Hamayan (1995) says, such alternative methods of assessment will not be considered to be part of the mainstream of language assessment until they can be shown to be both valid and reliable.

Methods of alternative assessment are not, of course, solely used for classroom purposes. Many alternative assessment schemes are initiated by local or national government agencies (see Brindley 1998, Stansfield 1994) with aims such as comparing students' levels of linguistic ability or comparing levels of instruction across institutions. Governments (sometimes in a hurry) wish to use the results for their own aims (Brindley 1998). They do not appreciate the need for careful trialing, and therefore they do not always allow researchers the time to try out the assessment instruments. Some types of assessment used in these circumstances may have high face validity—they may look excellent to the uninformed—but they may be marred by inappropriate marking schemes and rating inconsistencies. Trialing such measures is essential if the final tools are to be valid and reliable, but unfortunately such pre-testing and subsequent editing of materials takes time, and time is often in short supply. Inevitably, the ensuing tasks and marking schemes are not valid and reliable (Brindley 1998), and such schemes, therefore, launched with much fanfare, may produce invalid results which are unfair to students and teachers alike. If all assessors appreciated the importance of trialing in the construction of all assessment procedures, they might be able to work together to tell governments and other funding bodies that test development requires more time if assessors are to devise satisfactory assessment instruments.

The present move towards the inclusion of more performance testing in examinations (see for example the University of Cambridge Local Examinations Syndicate examinations) is also likely to bring 'testing' and 'assessment' closer together, but, unfortunately, because of financial and practical constraints, some large-scale tests are likely to remain much as they are, with uncontextualized, multiple choice items. There is a danger that the authors of such large-scale tests will be marginalized, and that their thorough work on pre-testing their items will not be appreciated because of perceived weaknesses in test content. Indeed, it is possible to envisage a day when performance testers and alternative assessors align themselves against the producers of large-scale tests. Such a division must not be allowed to occur.

3. Advances in computer assessment

It is probably too early to say whether advances in the use of computer technology for testing will have a positive or a negative effect on testing and whether computer administered tests will be distrusted by 'assessors.' Until recently, computer testing tended to fossilize existing objective testing methods because objectively marked items such as multiple-choice questions and gap-filling tasks were straightforward to answer on the computer and were easy to mark mechanically. Any attempts to introduce interesting new methods of assessment and testing were foiled by limitations in the memory size and processing speed of the computers. The move of the TOEFL towards computer based testing too has, at least in the short run, extended the use of multiple choice and other easy-to-mark objective items in computer tests. However, it seems that the promised testing revolution may at last be on its way. The expanding use of video conferencing and video interviews, the comparative ease with which videos and listening extracts can now be downloaded from the Web, the improvement in the computer's ability to recognize sounds and letters, the expanding uses of language corpora for teaching and testing, and the increasing and more rapid storage capacity of modern computers are all widening the scope of computer administered tests (see Burstein, *et al.* 1996, Drasgow and Olson-Buchanan 1998, Ordinate Corporation 1998). These advances will not only increase the efficiency of standardized tests, but will increase the scope of other elicitation techniques.

One project that has the potential to produce interesting and yet easy-to-deliver-and-mark tests is DIALANG, which aims to produce diagnostic tests in 14 different European foreign languages (DIALANG 1997). The tests will be delivered on the world wide web; they will be computer adaptive (see Chalhoub-Deville and Deville 1999); and students, after taking their chosen test, will receive instant diagnostic information about the strengths and weaknesses of their performance. At present, compositions written for DIALANG will be marked by hand, but this may not always be the case as there are now research projects looking into the computer marking of tests of language production (see Burstein and Chodorow 1999). Although it is hard to imagine computers ever replacing human markers, and we might not wish them to, it is possible that they will take some of the drudgery away from subjective marking and will thus make the marking task easier and more interesting for the raters.

There will thus, in the near future, be great advances in computer testing. However, we cannot yet know whether or not there is still a danger that the use of computers will limit rather than expand the kinds of tests that will be used.

CONCLUSION

One of my aims in this article has been to discuss the need to bring 'testers' and 'assessors' closer together, and I expect that over the next decade any differences between them will become less and less marked. 'Testers,' I hope, will become more open to ideas of different kinds of assessment, and 'assessors' will be more willing to accept that even the most carefully designed task or set of marking criteria needs to be trialed. If 'testers' and 'assessors' can each see that they are aiming for the same goal, they will perhaps start a dialogue which might transform both tests and assessments. Similarly, on a larger scale, the basic issues of testing and assessment are important in all areas of applied linguistics that call on the use of elicitation techniques to collect data. All such elicitation techniques should be reliable and valid. Understanding this connection, however, will only be possible if all putative applied linguists (and all potential language teachers) are introduced during their training to the vital tenets of testing so that they can be more critical of the elicitation techniques they use.

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Alderson, J. C. and D. Wall. 1993. Does washback exist? *Applied Linguistics*. 14.115–129.

This article opened language testers' eyes to the fact that, although the expression 'washback' was freely used in language teaching and testing communities, and although there was plenty of anecdotal evidence as to its existence, there had been few serious attempts to define it or to investigate its existence and possible effects. The authors reported on the few existing studies of language testing washback and listed fifteen washback hypotheses which, they said, should be investigated. This article led to a flurry of investigations into test washback, and the results of the first of these studies are now being published.

Bachman, L. F. 2000. Modern language testing at the turn of the century: Assuring that what we count counts. *Language Testing*. 17.1.

This is a state-of-the-art article on language testing in the year 2000. After a brief overview of testing in the 1980s, Bachman comments on some of the main areas of interest in the 1990s: criterion referenced measurement, generalizability theory, item response theory, structural equation modeling, qualitative research approaches, testing cross-cultural pragmatics, testing language for specific purposes, testing vocabulary, computer based assessment, and research into factors that affect performance. He also discusses recent theories of language testing and the concept of communicative testing. He concludes his overview of the 1990s with discussions of test washback and test ethics, and then turns to what lies ahead.

Bachman, L. F. and A. Cohen. 1998. Language testing—SLA interfaces: An update. In L. F. Bachman and A. Cohen (eds.) *Interfaces between second language acquisition and language testing research.* Cambridge: Cambridge University Press. 1–31.

This chapter serves as a useful introduction to the book, *Interfaces between second language acquisition and language testing research.* It discusses the reasons why SLA and language testing were for some time viewed as totally distinct, and it gives reasons why in recent years the two fields seem to have moved closer together. Bachman and Cohen describe areas of common interest between SLA and language testing and make recommendations for future joint areas of research.

Bachman, L. F. and A. Palmer. 1996. *Language testing in practice*. Oxford: Oxford University Press.

This book, which is a key textbook in language testing at present, is composed of three parts: Part 1 discusses the conceptual basis of test development and includes the Communicative Language Ability model, which is used as the basis of much current research in language testing; Part 2 describes the stages of language test development; and Part 3 describes a set of ten illustrative test development projects ranging from a placement test used in a U.S. university to a syllabus based test for primary school children.

Brindley, G. 1998. Outcomes-based assessment and reporting in language learning programmes: A review of the issues. *Language Testing*. 15.45–85.

In this article, Brindley discusses national standards, frameworks, and benchmarks of various kinds. He shows that the introduction of such systems has sometimes been problematic because of political, practical, and technical factors. Brindley discusses what the problems are and makes suggestions for how future systems might be more successfully implemented.

Brown, J. D. and T. Hudson. 1998. The alternatives in language assessment. *TESOL Quarterly*. 32.653–675.

The main purpose of Brown and Hudson's article is to help language teachers decide what types of language tests they should use in the classroom. The article discusses the concepts of validity and reliability, and lists the different kinds of tests that teachers might use. The authors group tests under various headings such as 'selected response' and 'performance assessments' and describe the advantages and disadvantages of each type.

Clapham, C. and D. Corson (eds.) 1997. *Language testing and assessment, Vol. 7. The encyclopedia of language and education.* Dordrecht, Holland: Kluwer Academic.

This volume contains 29 chapters on different aspects of first and second language testing and assessment. Each chapter presents a state-of-the-art description of one aspect of language assessment and provides a bibliography of about 30 references for future researchers in the field. The book is divided into four sections covering the testing of individual skills, methods of assessment, quantitative and qualitative approaches to test validation, and the ethics and effects of testing and assessment.

McNamara, T. 1996. *Measuring second language performance.* London: Longman.

This highly readable book starts with a discussion of communicative testing and defines what McNamara means by performance testing. This discussion is followed by a valuable discussion of the influential models of communicative language testing that have been devised since Dell Hymes introduced his theory of communicative competence in 1972. In the second part of the book, McNamara starts by describing a performance test, the Occupational English Test, and then devotes most of the rest of the book to a discussion of the use of Rasch multi-faceted measurement for research into the assessment of second language performance.

Messick, S. 1996. Validity and washback in language testing. *Language Testing.* 13.241–256.

This article focuses on washback and the consequential aspects of construct validity. Messick relates washback to his overall conception of validity and, in doing so, explains his ideas about validity more clearly and concisely than he did in his seminal 1989 article.

Shepard, L. 1993. Evaluating test validity. *Review of Research in Education.* 19.405–450.

This article discusses validity in educational measurement as a whole. Shepard starts by describing the evolution of the concept of validity over time and then devotes the second half of the article to a very clear explanation of Messick's theory of validity. She concludes the chapter with comments on the implications of this reconceptualizing of the term for new test standards.

Wall, D. 1996. Introducing new tests into traditional systems: Insights from general education and from innovation theory. *Language Testing.* 13.334–354.

This article describes several key concepts in educational innovation. The author applies these concepts to the teaching of English as a foreign or second language and relates them to a study she carried out into the washback of a new school examination in Sri Lanka. She shows how the belief that assessment and the curriculum would together affect teaching in the classroom turned out to be misplaced, partly because of discrepancies between the curriculum and the examination, and partly because of a lack of teacher training in the new 'communicative' methodology. In her conclusion, she makes suggestions as to how future investigations into washback should be carried out and how innovations in the classroom might be brought about more successfully.

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SECOND LANGUAGE ACQUISITION AND SECOND LANGUAGE PROCESSING

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SECOND LANGUAGE ACQUISITION AND APPLIED LINGUISTICS

Diane Larsen-Freeman

INTRODUCTION

Just as applied linguistics (AL) may be said to be an emerging discipline, so too is one of its sub-fields, second language acquisition (SLA). The parallelism may not be surprising; after all, a difference of only about twenty years separates the points at which the two were identified as autonomous fields of inquiry.[1] Then, too, the two share central defining concepts. AL draws on multidisciplinary theoretical and empirical perspectives to address real-world issues and problems in which language is central (Brumfit 1997). SLA draws on multidisciplinary theoretical and empirical perspectives to address the specific issue of how people acquire a second language and the specific problem of why everyone does not do so successfully. Furthermore, the two share something else: At this juncture in the evolution of AL and SLA, both are grappling with fundamental definitional issues, ones even extending to the nature of language itself. (See Larsen-Freeman 1997a for how this is true of AL.) Should AL and SLA deal successfully with these challenges, both will have much to contribute in the decade to come. Should they instead succumb to internecine feuding and fragmentation, the future will not be as bright.

In this chapter, I will first make some introductory remarks about the SLA process and the differential success of second language learners. Next, I will discuss the fundamental challenges that this characterization faces. Then I will say what contributions I think SLA is capable of in the coming decade; I will also note the main obstacles confronting it. I will conclude by nominating topics for a training and development curriculum for future applied linguists from an SLA perspective.

THEORETICAL FOUNDATIONS OF SLA: THE ISSUE OF ACQUISITION AND THE PROBLEM OF DIFFERENTIAL SUCCESS

The disciplines that SLA draws on, and potentially contributes to, are many. Some of the more prominent include: first language acquisition, linguistics (e.g., issues of language transfer, UG), psychology (e.g., information processing, skill-learning, connectionism), sociolinguistics (e.g., variation, pragmatics, sociocultural theory), and education (e.g., immersion, input-based teaching approaches). It would be impossible to review here the many recent research findings that have contributed to our understanding of SLA from these disciplines; thankfully, it is also unnecessary. The previous volume of the *Annual Review of Applied Linguistics* featured up-to-date summaries of each of these areas (Foster-Cohen for first language acquisition, N. Ellis and Segalowitz & Lightbown for psychology, Young and Kasper & Rose for sociolinguistics, R. Ellis and Segalowitz & Lightbown for education; see also Mitchell and Myles 1998 for a recent review of these varied perspectives). The only discipline that was not specifically addressed in a separate chapter in last year's volume was linguistics; however, as Grabe (as Editor of the volume) noted in the Foreword, almost all of the authors that dealt with SLA issues felt obliged to address UG in their work, whether or not they accepted its tenets.

In place of a multidisciplinary research review, then, I will review the theoretical foundations of what has been referred to as "mainstream" SLA (Breen 1985). I do so in order to provide a backdrop for my later comments. My rendition will be brief, its brevity hopefully excusable because by now it is very familiar. Although admonished by Thomas (1998) to avoid "programmatic ahistoricity," most SLA researchers would agree that the autonomous study of SLA arose in modern times approximately thirty years ago (Gass, Fleck, Leder and Svetics 1998), born of observations concerning the systematicity of learners' language, which were inspired by the revolution taking place in linguistics and cognitive psychology at the time. In light of the status quo view that successful SLA was a matter of overcoming the habits of the first language, what was striking to researchers in those early days was the degree to which diverse learners' linguistic performance converged. To be sure, there were obvious individual differences and native language effects, with later studies bringing to light more subtle, yet widespread, L1 transfer. Still, the discovery of common morpheme accuracy or acquisition orders and common developmental sequences for basic syntactic structures generated a great deal of excitement. Even those who may not have accepted an innate LAD in its Chomskyan sense were impressed with the learners' creative construction and sought explanations for the shared features of learners' interlanguage (IL) by pointing to the learning and communicative strategies they employed, such as imitation of formulaic utterances, relexification, and incorporation. Clearly, learner performance was not just a reflex of the L1.

Due to SLA's pedigree, it is not surprising that a great deal of attention was given to the learners' developing morphosyntactic system. Learners were thought to be attempting to acquire the rules of the target language through an inductive hypothesis-formation process. Later, a more deductive process was proposed, one that was universal-grammar driven. Both processes were rendered possible when the input to learners was made comprehensible. This, in turn, was best accomplished when learners' negotiated meaning during communicative interactions. Understanding meaningful input and attempting to express meaning were hypothesized to stimulate interlanguage development.

However, learners needed to be at an appropriate developmental stage in order to benefit from any interaction. If they weren't able to process the input, interaction would not likely lead to IL restructuring. Even with favorable acquisition conditions, not all learners successfully traversed the IL continuum. L2 learners learned at different rates and ultimately attained different levels of proficiency. Many factors were posited to account for the differential success of L2 learners: motivation, attitude, aptitude, age, cognitive style, strategies, personality, hemisphericity, etc.

Recent research has centered on the role of input and interaction in SLA (see Gass 1997, Gass, Mackey and Pica 1998) and the facilitation of second language learning brought about by focusing learners' attention on linguistic form during communicative interactions (Doughty and Williams 1998, R. Ellis 1997, Spada 1997). Research on differential success has been extended recently by Schumann (1998) for neurobiology, Birdsong (1999) for the critical period hypothesis, and Breen (to appear) for other learner factors.

Of course, summarizing thirty years of SLA research, as I have done, is problematic for a number of reasons. First of all, I have omitted the names and individual contributions of many researchers. Second, it is a product of my own necessarily limited experience. Third, the coherence imposed by a retrospective perspective conceals disagreements along the way, many of which still exist, including at least the following:

- The extent of L1 influence on the L2,
- The role of formulaic utterances,
- The sufficiency of comprehensible input,
- The existence of free variation,
- The necessity of noticing,
- The value of explicit instruction,
- The feasibility of a non-interface position,
- The need for negative evidence,
- The existence of an age-related critical period,
- The teachability of "good language learner" learning strategies,
- The role of metalinguistic knowledge.

It is also common knowledge that, up to this point, SLA research has been rather limited. A great deal of the research has focused on the acquisition of European languages, the acquisition of second languages (as opposed to third, fourth, etc.), and, as I said earlier, mainly, although certainly not exclusively, on the acquisition of morphosyntax.[2]

However, in hindsight, and perhaps only because it is hindsight, it has seemed that these disagreements and limitations could be accommodated within the prevailing SLA paradigm. The disagreements have not all been resolved, nor all the limitations addressed; however, in theory, doing so might, for many of these issues, only require mid-course corrections or expansions. In contrast, at this point in its emergence, the sub-discipline of SLA is facing far more fundamental challenges. New theoretical perspectives have been advanced in the field without displacing established ones. This is not necessarily a problem, of course: In fact, it could be taken as a sign of vitality of the field. However, there has been a crescendo of dissonance accompanying the new perspectives which does not allow easy accommodation within the prevailing paradigm. I turn now to considering the dissonant perspectives.

CHALLENGES TO THE MAINSTREAM VIEW OF SLA

Challenges to the mainstream view have been issued concerning the language acquisition process, the language learner, and language itself. I will treat each of these in turn.

1. The language acquisition process

The most trenchant criticism of the characterization of the language acquisition process as I have just depicted it is that it fails to take into account the social reality: Mainstream SLA research is seen to be asocial (Breen 1985). While acknowledging the value of certain of its constructs (i.e., the learner's interpretation of meaningful input and the effort to express meaning as catalysts for language learning, the creative construction of interlanguage, and the use of learning and communicative strategies), Breen (1998) criticizes SLA research for being decontextualized. As he puts it, "Mainstream SLA research, in focusing upon the relationship between the learner and the language data, is conducted and reported on in ways that appear to overlook the social reality in which the research is actually conducted" (1998:116). The erroneous assumption, according to Breen, is that the interaction between the learner's mental resources and the features of linguistic input will provide a sufficiently adequate explanation of language learning. Crookes (1997) also points to SLA's individualistic, asocial orientation.

Others have found the highly cognitivist view of language acquisition to date to be a fundamental weakness, but have not been as circumspect as Breen and Crookes in their criticism. Firth and Wagner (1997) have proposed a radical reconceptualization of SLA study, asserting that language should be seen and studied as a social, contextualized phenomenon (Liddicoat 1997). In their critique, they reject fundamental concepts upon which mainstream SLA is based. For instance, they write, "...we are unable to accept the premises of 'interlanguage'—namely, that language learning is a transitional process that has a distinct and visible 'end'" (Firth and Wagner 1998:91). In the same vein, SLA researchers have been criticized for measuring learner performance against native speaker norms (Cook 1999, Klein 1998) so that learners are perceived as "failing" when they do not achieve them.

SLA researchers Lantolf and Appell (1994) and Hall (1997) have found in Vygotskyan ideas a theoretical stance to counter what they perceive to be a reductive cognitivism in the field. Vygotsky saw learning as embedded within, and inseparable from, social activity. These researchers propose an extension of investigations into SLA to include a "sociocultural" perspective. As Lantolf and Pavlenko (1995) put it:

> ...[sociocultural theory] situates the locus of learning in the dialogic interactions that arise between socially constituted individuals engaged in activities which are co-constructed with other individuals rather than in the heads of solipsistic beings. Learning hinges not so much on richness of input, but crucially on the choices made by individuals as responsible agents with dispositions to think and act in certain ways rooted in their discursive histories. Because of its insistence on the embeddedness of human activity, SCT allows us to observe learning in all of its fuzziness as it emerges from dialogic activity. This perspective is quite distinct from waiting for learning to crystallize into transitory or permanent steady states of IL competence (1995:116).

Mainstream SLA researchers have not been left defenseless. As Gass (1998), Kasper (1997), and Poulisse (1997) counter, social interaction has been studied, but since the focus of SLA is on language acquisition, not language use, it is natural to attend more to psycholinguistic variables than sociolinguistic ones. Long (1997) also makes this point, suggesting that the matter of the influence of social variables should not be subjected to polemics, but rather left to the results of empirical research to determine. A review of research findings thus far has led him (Long 1996) to conclude that whether or not learner interactions have occurred in "laboratory" or "natural" settings, the results have been very similar, Breen's (1996; 1998; to appear) conviction about the impact of contextual differences notwithstanding (see also Foster 1998, Tarone 1997).

2. The language learner

As for constructs of the language learner, they too have come under attack. Traditionally, the learner has been seen from an etic perspective, one that has led researchers, it is alleged, to see learners as idealized, autonomous language acquirers (Pennycook 1997). Perhaps, as Firth (1996), Firth and Wagner (1997), and Rampton (1997) argue, learner language forms are different from the target language structures, not because of incomplete L2 competence, nor fossilizations of IL forms, but rather because the marked or "deviant" forms are deployed by the learners for social purposes—they may be empathizing with their interlocutors, for example, or they may be reverting to earlier features of their interlanguage in order to signal that they are, in fact, learners (Rampton 1987). At the least, an emic perspective may sort out the motivation behind the use of such "deviant" forms. The position they seek to advance is that non-native speakers have multiple social identities, being a learner is just one of them.

The socioculturalists add that Activity Theory respects the agency of language learners, not depicting them as passive recipients of modified input, but as actively (co)constructing their own learning and identity in an L2 (Lantolf and Pavlenko 1995; to appear). In a similar vein, Norton and Toohey (to appear) challenge another long-standing concept of mainstream SLA by questioning the construct of "the good language learner" and the characteristics and behaviors associated with the concept by mainstream SLA researchers. Like Lantolf and Pavlenko, they argue that the construct fails to acknowledge the complex, social, cultural, and historical relationships and practices embedded in second language learning sites. The data they examine from two different contexts reveals how classroom practices and peer relationships shape the process and outcomes of learning for different learners.

Again, other SLA researchers have responded. Kasper (1997) points out that throughout social science, "...even disciplines such as anthropology that favor holistic and socially situated approaches to research, such as enthnography, construct their idealized agents by reducing away what seems trivial in terms of the adopted theory...." "The constructs 'nonnative speaker' and 'learner,' (rejected by Firth and Wagner [1997]) focus upon the aspect that is *common* to the studied agents, and relevant to the global research context (or discourse universe) of L2 generally and L2 acquisition (SLA) specifically" (1997:309). Long (1997) adds that Firth and Wagner's complaint—that SLA makes a distinction between native and nonnative speakers or learners while underestimating the importance of other social identities (father, friend, business partner, etc.)—is true; whether this is justified is a matter best left to empirical resolution.

3. Language

An additional challenge to the mainstream view of SLA is the nature of the property theory—"what a domain of knowledge is and how it is represented" (N. Ellis 1999:23). Gregg (1993:278) makes his position perfectly clear. To him, "...the overall explanadum is the acquisition (or non-acquisition) of L2 competence in the Chomskyan sense." Although not all SLA researchers would see explaining grammatical competence as the ultimate goal of SLA research, most SLA researchers have subscribed to the view, as I stated above, that language is a rule-governed phenomenon.

The theoretical underpinnings of the Chomskyan position are being increasingly challenged by empiricists who believe that language acquisition can be accounted for solely in terms of general learning and cognition, rather than a built-in UG (N. Segalowitz and Lightbown 1999; see also Robinson in press, Skehan 1998). Certain of them have looked to connectionist modeling of neural networks as representing a more plausible neural architecture than called for by an innate "language instinct" (Elman, *et al.* 1996, Quartz and Sejnowski 1997; cf. S. Segalowitz and Bernstein 1997). Significant for the prevailing SLA view, a connectionist explanation implies a non-rule, non-representation, activated node account of what is stored. Although connectionist networks exhibit behavior that could be described by rules, they are not rule-governed (N. Ellis 1998). Instead, artificial neurons extract regularities from masses of input data. Recent models have demonstrated that the acquisition of morphology (N. Ellis and Schmidt 1998) and syntax (MacWhinney 1997) may be accounted for by simple associative learning principles (N. Ellis 1998; 1999); in addition, such models have successfully simulated bilingual lexicons (Meara 1999b).

CONTRIBUTIONS TO, AND OBSTACLES CONFRONTING, SLA/AL IN THE COMING DECADE

1. Internal to the field

It seems to me that a major contribution that SLA/AL can make in the next decade will be to come to terms with these many challenges. How this mediation is to be accomplished remains to be worked out; however, it would be useful to consider certain alternative scenarios.

One option is to align oneself with one side of a debate and to adduce evidence (hopefully) to argue for its superiority. This approach is the normal *modus operandi* in science, of course—to subject disputes to empirical resolution. For instance, the debate over the goal of SLA research (to explain competence and/or performance) that ensued in 1990 (Gregg 1990, R. Ellis 1990, Tarone 1990; see also Brown, Malmkjær and Williams 1996) was one that would have had far-reaching consequences had one side triumphed. Upon subsequent review of the positions, however, Eckman (1994) concluded that the issue being debated was an empirical one and that more data were needed to adjudicate it. Eckman's conclusion illustrates this first option: Each side would be encouraged to pursue its own research agenda apart from the other(s): the psycholinguists separate from the sociolinguists, the innatists separate from the cognitivists/connectionists. Such an option, however, does not by itself respond to the charge made by Firth and Wagner (1998) that certain researchers, emphasizing the centrality of language acquisition over language use, erect "barriers, sealing off the area of SLA as a kind of intellectual 'private property'" (1998:91). In Firth and Wagner's view, "...SLA seems to be dominated by Chomskian thinking to such a degree that others' frames of reference for the understanding of language and cognition have become inconceivable" (1998:92).

It is important to note, however, that with any dualism, the hegemony can extend in either direction. As Kirshner and Whitson (1997) point out, "the Vygotskyan tradition is similarly weighted toward a deterministic social plane. The source of this weighting is the central tenet that '...social relations or relations among people genetically underlie all higher [mental] functions and their relationships'" (Vygotsky 1981:163, in Kirshner and Whitson 1997:8). Since it is rather unlikely that empirical findings will resolve these debates once and for all, it seems the field will be subjected to repeated hegemonic pendulum swings. Givón (1999) quotes the eminent biologist Stephen Jay Gould with regard to the debate between an innate generative position and a input-driven emergent position: "...I doubt that such a controversy could have arisen unless both positions were valid (though incomplete)..." (Gould 1977:59). A better option, then, to breach the hegemony alleged by Firth and Wagner is to adopt a more complex, multifocal strategy.

A pluralistic stance might have it that both individual-cognitive and social-cultural perspectives have their place, as do innatist and empiricist positions. Both are necessary; both have something to contribute. Poulisse (1997), for example, though arguing for a psycholinguistic perspective, observes that there is room for both psycholinguistic and sociolinguistic research. And Firth and Wagner (1998) do acknowledge that Long and Kasper were right to point out the importance of acquisition. Certainly one reading of Firth and Wagner (1997) is that they are simply seeking balance: SLA is imbalanced in favor of cognitive-oriented theories and methodologies, they assert, at the expense of socially-oriented theories and methodologies.

Pienemann (1998) makes a reasonable case for this second option, and also suggests a way that it might be managed. Advocating for a modular approach to complicated issues such as the nature of SLA, he points out that a worthwhile research strategy is to break down the task of explaining SLA into discrete subtasks. Germane to the present discussion, Pienemann recommends separating the cognitive from the social as each "...have a degree of autonomy, each following its own logic" (1998:35). This would achieve more, in Pienemann's view, than an attempt such as Towell and Hawkins' (1994) to integrate a parametrization approach with a cognitive one, since such a synthesis does not permit tests of all of the issues. Pienemann is careful to add, however, that the modular approach he proposes works well "...as long as the different modules are able to communicate with each other and are theoretically consistent" (1998:33). In a related comment, Gass (1998) holds that few would disagree that it is a good thing for data to be considered from different perspectives; however, she adds that for this multifocal approach to be a tenable option, we have to be asking the same questions. It is not clear that we are.

Liddicoat (1997), for example, makes the case that rectifying the imbalance is not all it would take:

> What F[irth] & W[agner] propose in their call for rebalancing the field of SLA requires not only a rebalancing of the theoretical stance of the field, but has far reaching implications for the ways in which research in the field is designed and carried out at practical levels. Reconceptualizing SLA to take into consideration language as a social and contextual phenomenon requires a concomitant reanalysis of the research methods used to collect the data used for SLA research to ensure that the adopted approaches do actually examine language in appropriate contexts (1997:316).

Without such a reconceptualization and a commitment to review and perhaps employ new research methodologies, then, it is not likely that we are going to meet Pienemann's conditions of communication and theoretical consistency. A third option, therefore, might be to reconceptualize the way we work—to deal with our differences by finding a way to transcend them. At the risk of overstating the need, I might even say that what is required is a paradigm shift (Gregg, Long, Jordan and Beretta 1997) or at least a shared epistemology.

It is my opinion that conceiving of language and its acquisition as complex, dynamical, nonlinear systems shows promise in this regard, providing a metaphorical lens through which diverse perspectives can be accommodated, indeed integrated (Larsen-Freeman 1997b; 1998; 1999). Innatism is reflected in such systems by the fact that they are very sensitive to their initial conditions, conditions following Chaos/Complexity Theory, which might be viewed as built-in fields of attraction. These systems can easily accommodate cognitive or connectionist perspectives as well as innatist views (MacWhinney 1998; 1999, Robinson in press). Computer implementations, at least, show that distributed dynamic systems with built-in attractors exhibit properties of adaptability, goal orientedness, self-repair, and efficient learning and recognition under noisy conditions (Mohanan 1992). These systems are also nonentropic. They are self-organizing, creating order where none existed before. They accomplish this both through an emergent process whereby individuals create new linguistic patterns or engage in morphogenesis, while at the same time, through an adaptation process, internal changes in their linguistic systems are subject to the pressure to conform or to adapt to those of other members of the community. Indeed, a social-interactive view of language acquisition is clearly compatible with this theory. (See, for example, Cameron 1999, Snow 1999.)

Obviously there are disadvantages to using such a wide-angle lens. First, if such an interpretation is ever to move beyond the metaphorical level, we run into problems with falsifiability due to its elaborate and integrated nature. For instance, a critical tenet of Chaos/Complexity Theory is that the behavior of the whole system emerges (i.e., it is not reflected in any one part, nor directed by a central executive). Second, importing a theory from one discipline into another is a risky business, particularly as the borrowing in this case is from a physical science to a social science. Third, this interpretation must still be subject to the same empirical rigor as any of the other perspectives—through model-building (Meara 1999a), laboratory-type research (Hulstijn and DeKeyser 1997), qualitative research (Edge and Richards 1998), etc. Nonetheless, I am convinced that a major contribution of SLA/AL over the next decade lies in coming to terms with our differences—not so that we all agree, but so that the field can become more inclusive, when justified, and so that the complexity of the SLA process and learners is duly respected. A coherent epistemology would be a remarkable contribution of the next decade. Should we fail to accomplish this, I fear that we will experience continued internecine feuding and fragmentation.

2. External to the field

Besides getting our own house in order, it should not be forgotten that SLA deals with real-world issues and problems. As indicated in the review of mainstream SLA, many researchers continue to seek optimal solutions to nettlesome pedagogical dilemmas of classroom instruction. In addition, SLA has not had much to say yet on the use of technology in second language learning (but see van Lier 1999). Questions that need addressing include, for example, whether computers encourage a different type of learning from what transpires in a classroom—what Papert (1980) called "syntonic" learning, for instance, or Noblett (personal communication) refers to as "relational learning." There are many other real-life problems to contend with these days which cry out for an informed SLA/AL perspective. The controversy over the use of Ebonics for instructional purposes is one (e.g., Rickford 1999). The challenge bilingual education faces in California is another (Krashen 1999). A third is the recent situation at the City University of New York, in which the time given to non-native speakers of English for remediation was seriously curtailed.

An obstacle related to our external agenda is our relative inexperience in the political arena. We need to learn how to become more politically-savvy advocates for our constituents—language learners and teachers.

THE TRAINING AND DEVELOPMENT OF FUTURE APPLIED LINGUISTS

It follows from this review, then, that from an SLA perspective, AL students should become well-versed in the extant paradigm, but should also be introduced to non-paradigmatic points of view. Varying proposals should be vetted, with their strengths and limitations discussed. In addition, the full spectrum of research methods, qualitative and quantitative, should be taught, with ample opportunity for first-hand, supervised application. Finally, a social-justice perspective should be cultivated. We might even consider some training in political activism, with the limited goal of encouraging future applied linguists to provide a rational voice when second language acquisition potential is threatened by political realities.

NOTES

1. Howatt (1984) dates the first use of the term "applied linguistics" to the inauguration of the journal *Language Learning: A Journal of Applied Linguistics* in 1948. Most SLA researchers would claim that SLA was launched in 1967 with the publication of Corder's "The significance of learners' errors."

2. For this reason, research investigating other languages is very welcome and seems to be growing (e.g., in 1998, a number of articles report on the acquisition of Japanese as a second language: Mori, Shirai and Kurono, Rounds and Kanagy). Also a good sign is the fact that entire volumes of leading journals have been devoted to other subsystems of language recently: for example phonology (Major 1998, Leather 1999) and vocabulary (Wesch and Paribakht 1999). In addition, the influence of second languages on third language acquisition has recently been examined by Williams and Hammarberg (1998) and Dewaele (1998).

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Breen, M. (ed.) To appear. *Learner contributions to language learning: New directions in research.* Harlow: Pearson Education.

The origin of this volume was the invited colloquium, "Constructions of the learner in second language acquisition research," presented at the 1998 Annual Conference of the American Association for Applied Linguistics. This collection of papers addresses two themes: how learners are constructed by research(ers) or by the learning process, and how learners themselves construct language learning conceptually or through action. Issues addressed by the authors paint a picture of the learner's contribution to SLA and how certain of these contributions appear to be related to success in language learning. It also reveals the diverse nature of learner conceptualizations. This book provides useful reviews of previous research in a wide range of aspects of SLA. More provocatively, it also challenges some of the "givens" in mainstream SLA research.

Gass, S. M. 1997. *Input, interaction and the second language learner.* Mahwah, NJ: L. Erlbaum.

The stated goal of the author is "...to provide a view of the relationship among input, interaction, and second language acquisition." In other words, it provides a good review of many of the issues in mainstream SLA. In a balanced way, Gass presents the major issues in the field (e.g., the question of negative evidence, variability in the input, the functions of modified input) with treatments of different theoretical perspectives (e.g., UG, MacWhinney's competition model, Krashen's monitor model).

Kirshner, D. and J. Whitson (eds.) 1997. *Situated cognition: Social, semiotic, and psychological perspectives*. Mahwah, NJ L. Erlbaum.

In their preface, the authors make the case that the shift within cognitive science to situated cognition theory is at least as profound as the shift from behaviorism to cognitivism some 35 years ago. They write that "...the opportunity to explore learning and knowledge as processes that occur in a local, subjective and socially constructed world is severely limited by behaviorist and cognitivist paradigms" (1997:vii). Situational cognitionists thus recognize the need for the integration of individual and social perspectives. Though there are no chapters on language acquisition, and only one chapter that deals with language (Gee's on reading), this book is relevant to mainstream SLA, which has, as I have indicated in this review, been accused of being asocial. There is also some interesting discussion on what new units of analysis would look like, a question I posed as an issue raised by a Chaos/Complexity Theory perspective (Larsen-Freeman 1997a).

MacWhinney, B. (ed.) 1999. *The emergence of language*. Mahwah, NJ: L. Erlbaum.

The chapters in this book were first delivered as papers in May 1997 at the 28th Carnegie Mellon Symposium on Cognition with the theme "Emergentist approaches to language acquisition." Although the papers mostly deal with first, not second, language acquisition, I like this volume for two reasons. First, although not all contributors subscribe to an explicit emergentist "party line," they are able to demonstrate the richness of seeing language and its acquisition from this perspective. Second, several of the chapters in this book walk the middle ground that I have here suggested might benefit SLA. As Editor, MacWhinney writes in his introduction: "Emergentism should not be interpreted as a radical rejection of either nativism or empiricism. On the contrary, emergentism views nativist and empiricist formulations as partial components of a more complete account. The traditional contrast between nativist and empiricism revolves around the fact that they describe developmental processes that operate across different time frames" (1999:xi). This is the same conclusion that I arrived at independently, which I applied to SLA in terms of discussing diachrony and synchrony in language, and acquisition and use in SLA (Larsen-Freeman 1999).

Mitchell, R. and F. Myles. 1998. *Second language learning theories.* London: Arnold.

The opening two chapters of this book introduce readers to key concepts in SLA and offer an account of its recent history. Six chapters follow, each surveying a different perspective on SLA: linguistic, cognitive, functional/pragmatic, input/interactional, sociocultural, and sociolinguistic. The authors include a balanced treatment of each, summarizing their strengths and weaknesses. They conclude by noting that grand synthesizing theories have not received much support in the field (although they do not mention which ones) and by emphasizing their impression that there is great diversity of perspectives. Writing a comprehensive account of the burgeoning SLA research at this point in time is a formidable undertaking, and so the authors probably chose wisely to approach it by discussing the various theoretical perspectives in the field. This is a valid and valuable way to make sense of the field. What is sacrificed in this representation, though, is much of the history and many of the details of the SLA research endeavor.

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STILL WRESTLING WITH 'CONTEXT' IN INTERLANGUAGE THEORY

Elaine Tarone

INTRODUCTION

One of the most intractable issues in the field of second-language acquisition (SLA) research has been the attempt to identify the role of social context in influencing (or not) the process of acquisition of a second language. The central question has been whether a theory of SLA must account only for the psycholinguistic processes involved in acquiring an interlanguage (IL), or, alternatively, whether social and sociolinguistic factors influence those psycholinguistic processes to such an extent that they too must be included in such a theory. It seems very clear that SLA is a psycholinguistic process. But to what extent are those psycholinguistic processes affected by social context? In 1985, Selinker and Douglas proposed a construct of 'discourse domains' to show how social and psycholinguistic processes might be included in a theory of interlanguage; Young (1999) reviews that proposal and a recent attempt to test it, concluding that the results are still uncertain. After 15 years, this is still a lively issue in the field of SLA. Indeed, it is becoming a source of increasing conflict both within the field of SLA and within such areas of applied linguistics as second/foreign language teaching and second/foreign language teacher training. In this article, I will briefly summarize the problem, and review and summarize the current evidence being brought to bear upon this issue in the SLA research literature.

CRITICISM OF SLA RESEARCH FOR IGNORING SOCIAL CONTEXT

Criticisms have been advanced both by applied linguists working in other areas and by SLA researchers themselves. Applied linguists working in other fields have become increasingly vocal in their criticisms of the SLA research endeavor. One of their common themes is the charge that too much SLA research focuses on psycholinguistic processes in the abstract and does not consider the social context of L2 learning. It is said, for example, that IL data are typically gathered from L2 learners in artificial settings, removed from the social contexts in which they normally use and acquire the L2. As a consequence, it is argued that the results of such SLA research are irrelevant to the concerns of applied linguists who must deal with L2 learners in social context, not in the lab. For example, Firth and Wagner (1997) state that

> SLA research takes a view of the learner that is too individualistic and mechanistic, and...fails to account in a satisfactory way for interactional and sociolinguistic dimensions of language. As such, it is flawed, and obviates insight into the nature of language, most centrally the language use of second or foreign language (S/FL) speakers (285).

The Firth and Wagner (1997) paper seems to have touched a sensitive spot with SLA researchers, generating several rejoinders in the same and subsequent issues of *Modern Language Journal* (Gass 1998, Kasper 1997, Long 1997; 1998, Poulisse 1997) and a reply from Firth and Wagner (1998). This article will not summarize that debate, but merely point out that it is not confined to the pages of the *Modern Language Journal*. Other applied linguists working in areas related to SLA have made a similar point, most notably Cook (in press) and Rampton (1995):

> The very undifferentiated portrait of the second language learner that emerges in SLA no doubt partly results from its tendency to thematise the learner's internal psychological condition. Rather than looking at interaction as a socio-historically sensitive arena in which language learner identity is socially negotiated, SLA generally examines learner behaviour for evidence of the determining influence of psycholinguistic states and processes (Rampton 1995:293).

Rampton argues that one problem with this approach is that SLA researchers who have ignored social context in their studies cannot then claim that their results are generalizable to all social situations. Crucially wrong assumptions may be made in such studies about the social conditions which normally hold for L2 learners in society, and wrong generalizations may be made:

> In the 'root image' underlying SLA research, it is assumed that L2 learning generates situational anxiety, that progression along the route towards target language proficiency is (or should be) the learner's abiding preoccupation, and that learner status is fundamentally stigmatised. All of these characterisations may be true of some, or indeed many, situations, but they are certainly not invariable... (Rampton 1995:292).

And, indeed, Rampton (1995) shows in graphic and very convincing terms that these very characterizations are simply wrong for the adolescent L2 learners in his ethnographic study in Great Britain.

The criticism of SLA research for failure to include social context has become so pronounced that, at present, some influential second/foreign language teacher trainers are even taking the position that L2 teachers do not need to know the results of current SLA research. So, for example, when Freeman and Johnson (1998) "reconceptualize" the knowledge base which second/foreign language teachers must have, they do not include any knowledge of language learners and language acquisition/learning. They explain the omission this way:

> In general, due perhaps to its roots in L1 acquisition and cognitive psychology, the field of SLA has viewed language learning from an individualist perspective. Thus, until recently, the field has not examined language learning from the standpoint of socially negotiated, constructivist processes that may be at play.... From our point of view...a social constructivist view of language learning would seem to interface more directly with the nature of classroom language learning.... Because the research knowledge per se does not articulate easily and cogently into classroom practice, much current knowledge in SLA may be of limited use and applicability to practicing teachers (Freeman and Johnson 1998:411).

This position is taken by two leaders in language teacher education in the theme-setting initial paper in a collection in *TESOL Quarterly* in December of 1998. It suggests that schools of education will not be major consumers of SLA research in the coming century unless SLA researchers can either convert teachers to a more psycholinguistic mode of thinking or show that they do study the impact of social context on processes of SLA.[1]

If we examine the criticisms of the applied linguists outlined above in light of actual publications in SLA, those criticisms seem unwarranted. In fact, as already seen in the case of Selinker and Douglas (1985), there are some SLA researchers who have for some time taken the position that SLA theory and research should explore the relationship between social context and psycholinguistic processes of SLA. More recently, Preston (1996) proposes an alternative psycholinguistic model of SLA in which social factors can constrain grammatical marking, both in competence and performance. Larsen-Freeman's (1997) rather different proposal that interlanguage be studied as a complex dynamic system, using correlational research designs in natural settings, provides a very promising framework for SLA research relating social and cognitive factors in the L2 learner. But such models are merely proposals; where is the evidence?

The second half of this paper will review a small but growing subset of SLA research work which demonstrates an impact of social factors on psycholinguistic processes of L2 acquisition. It would be premature for other applied linguists to dismiss the entire field of SLA research out of hand without considering the evidence produced in that field—some of which was laid out in Young (1999) and in Bayley and Preston (1996)—arguing that social factors are related to systematic variation in interlanguage and to SLA itself.

But why, if this work is being done, is it relatively unmentioned by mainstream SLA researchers with a psycholinguistic orientation? As the next section will briefly show, these two streams of SLA research have not, as yet, affected one another. The problem is that there is minimal overlap between them.

THE SPLIT IN SLA: RESEARCH ON COGNITIVE FACTORS AND RESEARCH ON SOCIAL FACTORS

Research on second language acquisition that takes a sociolinguistic or even co-constructionist orientation typically focuses on L2 use in natural social contexts at a single point in time. Note that the emphasis is on interlanguage USE in such contexts, but not typically on the acquisition of new elements of the interlanguage. Further, such studies typically do NOT focus on discrete grammatical, morphological, or phonological elements in the interlanguage. Rather, they typically focus on general pragmatic or discourse patterns. For example, Peirce (1995) shows that Martina, while usually hesitant in speaking English with Canadian interlocutors, became much more fluent in her use of English L2 when she perceived a threat to her home and had to talk to her landlord. Thus, the interlocutor and Martina's roles (when speaking as low status immigrant or as mother defending her family) were shown to influence Martina's IL USE and fluency. However, the study provided no evidence of her acquisition of any features of IL due to the forces of either interlocutor or social role. Similarly, Platt and Troudi (1997) trace an ESL child's failure to learn to read in her L2 to such social factors as the teacher's instructional style (following from her beliefs about the way L2s are acquired) and fellow students' willingness to help the learner get by without reading for herself. Platt and Troudi show that such social factors influence an L2 learner's discourse patterns and overall success in reading, but they do not show how these social factors influence the development or fossilization of specific features in the learner's interlanguage. And so it goes. All the studies cited in Tarone (1988) and most of those in Bayley and Preston (1996) can be argued to suffer from the same general deficiency: They demonstrate the impact of social factors on interlanguage USE at a single point in time and do not show that those social factors affect the ACQUISITION of SPECIFIC linguistic features of IL over time.

To be fair, since sociolinguistic and co-constructionist studies take place in very complex natural settings and focus on the language input and output of just a few individuals in those settings, it would be very difficult and time-consuming to establish that the acquisition of new L2 forms has been influenced by identifiable social factors. Such an enterprise would involve longitudinal studies of those learners and the transcription of long stretches of conversation in which it would be very difficult to identify the new forms being acquired. Thus, while SLA researchers who take a sociolinguistic or co-constructionist orientation have a good deal of evidence showing that L2 learners' IL USE is variably affected by identifiable features of social context, they have usually not tried to show that those social features change the process of L2 ACQUISITION—specifically, the acquisition of an IL linguistic system—in any clear way. They have assumed it, and asserted it, but not often accumulated the evidence to prove it.

Research on second-language acquisition that takes a psycholinguistic, or cognitive orientation, whether it operates within a UG framework or not (cf. Long's [1998] assertion that most SLA cognitive research does not belong in a UG tradition), is clearly focused on the goal of explaining how an interlanguage grammar gets acquired over time. As Kasper (1997) says, in the acronym SLA, "the 'A' is for acquisition," not use. Tightly controlled studies are designed to identify particular grammatical features to be acquired and explore the impact of various cognitive factors on the acquisition process. Such research, exemplified in articles by deBot (this volume) and Scovel (this volume), sets out to establish some clear causes for the acquisition (or fossilization) of very specific phonological and grammatical features of the L2. And since, in such studies, the social context is greatly controlled or reduced in complexity, and is usually fairly similar across university studies, such researchers have assumed that social factors are irrelevant for their work.

Thus, two strands of SLA research exist in parallel, but rarely focus on the same data or the same questions. The issue of the relationship between social factors and psycholinguistic processes of acquisition is, as Eckman (1994) points out, an empirical question, best resolved by the presentation of the right sort of data and not by argument alone. But neither strand of SLA research has consistently and systematically set out to gather the sort of data which might show whether social factors affect cognitive processes of acquisition in specific ways and thereby enable both strands to see how their work is related.

Long (1998) states the position of cognitively-oriented SLA researchers succinctly, and makes two assertions which can be empirically tested:

> Remove a learner from the social setting, and the L2 grammar does not change or disappear. Change the social setting altogether, e.g., from street to classroom, or from a foreign to a second language environment, and, as far as we know, the way the learner acquires does not change much either, as suggested, e.g., by comparisons of error types, developmental sequences, processing constraints, and other aspects of the acquisition process in and out of classrooms... (Long 1998:93).

These two assertions seem to provide useful ways to structure the remainder of the present article. There is evidence in the recent SLA research literature which may address both of the above assertions.

RESEARCH EVIDENCE AT THE INTERFACE OF SOCIAL CONTEXT AND INTERLANGUAGE GRAMMAR

1. Remove the L2 learner from the social setting: Does the IL grammar change?

Let us assume that we are not talking about instantaneous changes—instantaneous acquisition of entirely new rules, or a switch to a completely different learner grammar—as the learner moves from the classroom to the hallway. Positing such switches from one grammar to another would certainly violate Occam's Razor. But we do know from research on English for Specific Purposes (Bhatia 1993, Swales 1990) that different social situations often require different registers of English, some of them with rules for grammatical usage that differ markedly from those for general English. For example, the rules for tense usage in academic research papers are distinctly different from those for general English. (See Swales 1990 for a review.) Active and passive aspect are patterned quite differently in astrophysics papers than in publications for researchers in other fields (Tarone, *et al.*, 1981 [1985; 1998]). We could assume that the IL grammar stays the same but is in fact variable, sensitive to social setting at any given point in time (a position consistent with studies in Bayley and Preston 1996, Preston 1996, Tarone 1988, and others). In this view, the entire IL grammar at any given time consists of a range of styles. As the learner moves from one social setting to another, the IL grammar does not change wholesale—the learner just accesses one or another style of a grammar that stays the same.

Perhaps a more empirically interesting way to paraphrase the question above is as follows: If two L2 learners acquire English in two different social settings, will those learners internalize two different IL grammars? The answer to this question, based on the research evidence, is surely yes. As just seen, ESP research shows that the TL rules to be learned vary in specific ways from one social situation to another. The classroom may expose L2 learners to only one rather formal register (Cohen 1997, Cohen and Tarone 1997, Tarone and Swain 1995). Tarone and Swain (1995) show that the immersion classroom provides input only in an academic register of L2, while an L2 adolescent vernacular register is only available in other social settings. Thus, it is well-established that, for any given target language, the L2 learner receives different input on the grammatical and lexical features to be acquired in different social situations.

But there are also other ways in which social context can influence the TL input given to learners. The degree to which native speakers adjust their language for learners may differ in different social contexts, and the amount of overall modeling and collaborative assistance given to learners may also differ in different social situations. For example, social context affects the degree to which interlocutors make linguistic and conversational adjustments for learners. It was initially claimed (Long 1980; 1983) in fairly general terms that all native speakers adjust the input they give to L2 learners. Based on his study of 16 elementary level non-native speakers of English performing six tasks with native speakers they had never met before in a lab at UCLA, Long identified a set of linguistic and conversational adjustments in the input given to the learners. Long's study and his review of the literature suggested to him that foreigner talk could be found in virtually all groups of people addressing speech to learners:

> (1) in children as well as adults, (2) in upper-middle, middle and working-class adults, (3) individuals with or without prior FT experience, and 4) second language teachers, content-teachers and non-teachers.
>
> ...linguistic and conversational adjustments...appear to be immune to differences among groups/types of speakers (Long 1983:184).

More recently, however, Gass (1997) draws a different conclusion in reviewing the research on simplification of input to L2 learners. She cites several studies which show that some individuals in some social situations do not modify their speech, even for people experiencing obvious language difficulty. She notes two studies which document such "counter-accommodating behavior": Arthur, *et al.* (1980) and Varonis and Gass (1985). Data from the latter study are discussed in Gass (1997:64–66), particularly a long telephone conversation between a native speaker at a TV repair shop and an L2 learner who believes he is calling a TV sales shop. In that conversation, which is fraught with misunderstandings, the native speaker does not make linguistic accommodations for the learner: She speaks rapidly, uses contractions and idiomatic language, and shows none of the conversational adjustments which are supposedly constant across social situation and interlocutor. Bondevik (1996) discusses similar findings in a more controlled study in a Minnesota electronics store. Each of four salesmen from Minnesota failed on three different occasions to accommodate to different L2 learner listeners by making linguistic and conversational adjustments; one even complexified his syntax after learners indicated noncomprehension. In subsequent interviews with the salesmen, one said that he felt it would have been insulting to simplify his speech in that context. Yet the listeners in Long (1980; 1983) did simplify their speech. Thus, the research evidence indicates that interlocutors in differing social situations provide L2 learners with differing amounts of adjusted TL input; some do not accommodate to learners by simplifying linguistic input at all. If simplified input is important to the SLA process, then we must conclude that the process of SLA is affected differently in these different social contexts.

But the input provided to learners in different social contexts differs in one more way: The overall modeling and collaborative assistance given to learners may also vary from one context to another. In conversation in certain formal institutional contexts, learners may not have direct access to the L2 input they need. Bardovi-Harlig and Hartford (1996) studied the sort of input which is available to L2 learners in the institutional setting of the university academic advising session. They described this session as "an unequal status encounter that by nature is a private speech event and cannot be observed by other learners." Thus, the L2 learner entered this encounter with no previous input or preparation on the sort of language that would be needed. Although the advisors attempted to guide the students in choosing courses for the coming term by teaching them that student suggestions are expected, and that certain types of content are appropriate for those suggestions, they did not teach the students appropriate linguistic forms for the invited speech acts, and they provided corrective feedback on meaning, not form. When the higher-status, more powerful advisors tried to make suggestions for the students, those suggestions could not serve as direct models of appropriate language use for the students. Examples were "I'm going to have you take...," "we'll ask you to take...," and "I would suggest...." Additionally, learners whose mastery of tense-mood-aspect morphology did not enable them to mitigate as required would have had especial difficulty with this type of situation. In a similar study of interactions in institutional settings, Tarone and Kuehn (in press) taped L2 learners going through intake interviews in a welfare office. They showed that this too, as a private unequal status encounter, provided little or no useful input for L2 learners to use in order to know what applicants should say, or how they should say it. As a consequence, L2 learners had demonstrable difficulty understanding and responding to directives and suggestions being made by the welfare worker. Their attempts to communicate in this situation were not well supported.

In contrast with the restricted available input in these two institutional situations, there was very collaborative input and co-construction provided to L2 learners in social situations documented in two other recent studies. Parks and Maguire (1999) reported on the way in which francophone nurses, newly hired in an English-medium hospital in Montreal, acquired skill in writing nursing notes in English L2. In a highly collaborative process, the francophone learners observed more experienced nurses as they interacted with patients about to be discharged, interacted themselves under observation, solicited input from supervisors and co-workers, got and used advice given, and revised and produced notes in a highly collaborative process. Parks and Maguire concluded:

> ...when nurses had questions about language they did not have to rely solely on their internalized language resources but were able to have access to resources in the form of relevant documentation or more knowledgeable others, who confirmed or disconfirmed hunches or supplied genre-specific language. Indeed, all acts of language use, whether oral or written, are inherently social and context specific (1999:166).

The data provided in Parks and Maguire (1999) actually could allow us to move beyond language USE, since it shows how, over time, input provided by others gradually becomes incorporated into each new revision of nursing notes. Though the authors did not point this out, the data in the paper even show changes in a grammatical construction produced by the learner, from an initial erroneous "was been given" to a correct "was given." Co-construction is a central feature of another study: Swain and Lapkin (1998) recorded and analyzed the way in which two French immersion students worked together in a dyad to co-construct a story. In this study, the authors focused on ACQUISITION of L2 linguistic items. The learners worked together to help each other identify lexical and grammatical forms which they later used in their report; forms were proposed and then revised to become more target-like over the course of the learners' interactions. In this study, collaboration in this social context permitted the learners to focus on form and internalize specific new features of an IL grammar.

In summary, we have seen that L2 learners in different social contexts receive input which contains different grammar rules (cf. the ESP research), or which contains more or fewer linguistic/conversational adjustments, or which provides more or less explicit modeling and co-construction to support the acquisition process. Thus, because the TL input provided in different social situations is different, the IL grammars which can be acquired in those contexts must also be different.

2. Change the social setting altogether: Will the way the learner acquires L2 change much?

This second question focuses more specifically on certain types of change in acquisition processes that might arise due to different social settings. These processing changes might include error types, developmental sequences, processing constraints, and other aspects of the acquisition process. There is, in fact, research evidence that error detection, developmental sequences, and negotiation of meaning may all be sensitive to social context.

Kormos (1999), in an extensive review of processes of monitoring and self-repair in the use of an interlanguage, shows that while Levelt's perceptual loop theory of monitoring can account for monitoring in IL speech, it needs to be supplemented with recent research on consciousness, attention, and noticing if it is to account for mechanisms of error detection in using an IL. The studies she reviews suggest that error detection in L2 depends on several factors, some of them psycholinguistic, like the availability of attention. However, error detection also depends on social context factors such as the "accuracy demand of the situation" and "various listener-based discourse constraints" (1999:324). Kormos concludes that diverse results on the rate of well-formed repairs in studies with different research designs (cf. Levelt 1983, van Hest 1995) suggest that the well-formedness of corrections is both speaker-based and listener-based. "...[S]peakers will strive to produce well-formed repairs not only because their original speech plan needs to be encoded again, but also because they want to aid their interlocutors" (1999:330). We must assume that if the learner is correcting errors differentially in different social contexts to accommodate to different interlocutors, then the errors which remain uncorrected in those social contexts will be different.

Developmental sequences of SLA can also be influenced by factors of social context. Here we have only a small amount of intriguing research evidence, and a puzzling lack of attempt to obtain any more such evidence. Liu (1991), and Tarone and Liu (1995; see discussion in Young 1999) show that a 6-year-old Chinese boy acquiring English L2 in Australia over a two-year period acquired Pienemann and Johnston's (1987) six stages of interrogatives in a different order from that predicted. Stage 4 and 5 questions were acquired before Stage 3 questions. Each new stage of interrogative formation except for one was produced in conversation in a single social context: in play sessions with the researcher at the learner's home. Each new stage of question then gradually spread to other social contexts, appearing next in conversations with other peers in desk work at school, and last in conversations with the teacher in school. Liu (1991) argues that there was something about the social context of play sessions at home with the researcher which caused later-stage questions to emerge before earlier-stage questions in this learner's interlanguage. Aspects of input (Young 1999), and aspects of play (cf. Tarone 1999) have both been cited as possible characteristics of this social context that altered the sequence of acquisition of questions for this learner. To date, there have been no other reports of research studies which examine the impact of different social contexts on the sequence of acquisition of any phonological, morphological, or grammatical feature of interlanguage. This absence of studies designed to obtain relevant data on possible interactions between social context and sequence of acquisition is hard to account for. Certainly it represents a gap in the literature that needs to be addressed.

In contrast to the above, there have been many studies focusing on interaction and negotiation as a central process in second-language acquisition. Negotiation is important because it leads to the psycholinguistic event of noticing that a linguistic form needs to be acquired:

> The input-interaction view must take the position that noticing is crucial. In negotiation the learner is focusing on linguistic form, and that focus, or specific attention paid to linguistic form, is the first step toward grammar change (Gass 1997:101).

Several recent studies of negotiation show that the negotiation process can be highly sensitive to social context. Gass (1997), in her substantive review of input, interaction, and second language learner, states:

> It would be too simplistic to assume that these integral parts of negotiation sequences occur without influence from the context in which they appear. To the contrary, many factors affect the structure of conversation (Gass 1997:117).

She then reviews studies which show the following features of social context to be important factors affecting negotiation:

1. Task type (where a task requiring the exchange of information results in more negotiation; a task which is student-student involves more negotiation than one which is teacher-fronted),
2. Background knowledge and status differences (where great status differences inhibit negotiation, and gaps in background knowledge provide more opportunities for negotiation),
3. Familiarity (where conversation partners who know each other negotiate more), and
4. Gender (where same gender partners negotiate more).

Disturbingly, Foster (1998) has found that the social context of the ESL classroom may be one which promotes little negotiation of meaning. Foster observed 21 intermediate level ESL students as they worked in dyads vs. small groups, doing tasks with optional or required information exchange. She found that many learners in small groups did not speak at all, and many more in dyads and groups did no negotiated interaction. Very few modified their utterances on the basis of interaction. Lyster (1998) found that French immersion teachers also did not respond to learner errors in ways that allowed for much negotiation to occur. In particular, teachers did not promote negotiation that drew learners' attention to errors of form. Thus, in different social contexts, the degree of negotiation of meaning (or, in theory, of focus on form) may vary tremendously.

But to what extent do these differences in negotiation lead to differences in noticing, or in a focus on linguistic form? We are beginning to see research on the impact of negotiation on noticing of particular linguistic features. Mackey, *et al.* (in press) found that L2 learners who are given implicit negative feedback while in the process of negotiating for meaning do not always notice that feedback. Feedback on phonology and lexis is noticed readily, but feedback on morpho-syntax is not, nor is it incorporated into subsequent learner production. How does social context affect this process of noticing? Does one notice more linguistic form when one's interlocutor is a teacher, as opposed to when the interlocutor is a student? Research on style shifting suggests that learners certainly adjust their speech towards the TL norm more in the presence of a teacher (e.g., Blanco-Iglesias, Broner and Tarone 1995, Liu 1991), but studies on differential noticing in response to such features of social context as interlocutor do not seem to exist.

As Gass (1997) points out, negotiation for meaning is only one possible means of getting L2 learners to focus on form. Another means proposed more recently by Cook (1997; in press), Tarone (1999), and Tarone and Broner (1999) is language play, which occurs in some social contexts more than others. Play with L2 forms at all linguistic levels may be another contextually-influenced way of drawing L2 learners' attention to language forms that need to be acquired.

Work on language play, the social contexts in which it occurs, and its impact on second-language acquisition is just beginning.

To conclude this section, there does appear to be evidence in the literature to suggest that if we change the social setting altogether, the way the learner acquires [L2] does seem to change, at least with regard to error correction, developmental sequences, and negotiation of meaning.

CONCLUSION

There are SLA researchers who are exploring the ways in which social context may affect the acquisition of specific L2 forms. It thus appears premature for other applied linguists, or for SLA researchers themselves, to assert that the field has no interest in examining SLA in its social context. But there is also a good deal of research study to be done, particularly in documenting the impact of social factors on the psycholinguistic processes of acquisition of specific interlanguage morphosyntactic, lexical, and phonological forms. And what might an SLA theory look like that incorporated both social and psycholinguistic factors? Two theoretical proposals, those of Preston (1996) and Larsen-Freeman (1997), appear especially promising in their capacity to bring the two strands of research, the psycholinguistic and the sociolinguistic, together in a single framework. Work in this area appears important, and quite promising.

NOTES

1. For one response to Freeman and Johnson (1998), see Yates and Muchisky (1999).

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Bondevik, S.-G. 1996. Foreigner talk revisited: When does it really occur and why? Tromso, Norway: University of Tromso. MA thesis.

Exploring the factors which trigger foreigner talk, the researcher conducted a study in an American electronics store. Over a period of several weeks, three L2 learners and a native speaker customer entered the store at different times, and each one talked to each of five native-speaker salesmen. All of the "customers" indicated serious noncomprehension at similar points in the conversation, and the salesmen's subsequent speech was analyzed to see if they had made linguistic or conversational

adjustments to help their customers understand. Results showed that four of the five Minnesota salesmen did not use foreigner talk with the learners, not even with one who looked foreign and had a pronounced accent, while the one salesman who had lived in California did. One Minnesotan even complexified his speech after noncomprehension had been indicated. In interviews, he said he felt it would have been insulting to simplify his speech to his customers.

Larsen-Freeman, D. 1997. Chaos/complexity science and second language acquisition. *Applied Linguistics*. 18.141–165.

The author outlines a number of ways in which interlanguages exhibit the features of complex nonlinear systems: IL is characterized by dynamic processes; it is complex, with many interacting factors that determine its developing trajectory; it does not develop in a linear fashion; and it is an open, self-organizing system with continued input. The author uses this perspective to examine five issues in SLA: mechanisms of acquisition, definitions of learning, the instability and stability of interlanguage, differential success, and the effect of instruction. Adoption of this perspective would discourage theory construction through the aggregation of simple univariate cause-effect links, underscore the importance of details, and encourage a focus on the whole process of SLA rather than just a part.

Long, M. H. 1998. SLA: Breaking the siege. *University of Hawai'i Working Papers in ESL*. 17.79–129.

The author responds to three published criticisms of SLA research—that too many SLA researchers (a) focus overly narrowly on learner-internal, cognitive processes; (b) use an outdated "realist" perspective, ignoring the insights of post-modernist scholars; and (c) claim implications for second-language teaching from their research when they do not exist. The author takes on one paper claimed to represent each critical position (papers written by Firth & Wagner, Lantolf, and Nunan respectively). He concludes, rather contentiously, that none of these positions has any validity at all. While this reviewer is sympathetic with some of Long's positions, his rhetoric in this paper appears too extreme. Unfortunately, Long concludes by suggesting that research journals in the field which publish such attacks on SLA research are thereby not maintaining high enough standards of scholarship.

Preston, D. 1996. Variationist perspectives on second language acquisition. In R. Bayley and D. Preston (eds.) *Second language acquisition and linguistic variation*. Amsterdam: J. Benjamins. 1-46.

The author states that sociolinguistics as a discipline has much to contribute to the field of SLA, but that several factors have prevented a healthy relationship between the two fields: 1) variationists have not advanced plausible psycholinguistic models of SLA; 2) SLA researchers do not understand the aims of sociolinguistics as a field, or its tools and methods; and 3) many SLA researchers tend to rely overmuch on a UG framework which is too narrow to account for SLA. A variable psycholinguistic model is proposed to account for SLA data, one based on the analogy of weighted coins being flipped, the "coins" being selection devices in competence and performance which are sensitive to linguistic and stylistic factors.

Tarone, E. and M. Broner. 1999. Is it fun? Language play in a fifth grade Spanish immersion classroom. Unpublished manuscript, University of Minnesota [under review].

The authors discuss two kinds of language play which appear in the discourse of fifth grade Spanish immersion students: private speech used for purposes of rehearsal of target forms and ludic speech used for purposes of self-amusement and creativity. Examples of both kinds of language play are identified in the natural classroom L2 discourse of three learners, observed and taped over a period of five months. Five criteria are used to distinguish effectively the two kinds of play in most cases. The paper concludes with a brief discussion of the differing possible roles of each kind of language play in the process of SLA.

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FRENCH IMMERSION RESEARCH IN CANADA: RECENT CONTRIBUTIONS TO SLA AND APPLIED LINGUISTICS*

Merrill Swain

INTRODUCTION

This review chapter addresses two questions: What has the recent research conducted in French immersion programs in Canada contributed to our understanding of second language acquisition (SLA)? What has it contributed to the broader field of applied linguistics? In this chapter, I also consider briefly what the research contributions of the coming decade might be and discuss some of the obstacles that may be faced in Canada in continuing to conduct research concerned with French immersion education.

FRENCH IMMERSION EDUCATION AS A TYPE OF BILINGUAL EDUCATION

Bilingual education has been defined as "schooling provided fully or partly in a second language with the object in view of making students proficient in the second language while, at the same time, maintaining and developing their proficiency in the first language and fully guaranteeing their educational development" (Stern 1972). Depending on the social, linguistic, educational, and political contexts, these goals of bilingual education can be achieved in many ways, immersion education being one of them.

French immersion (FI) education in Canada takes several forms, but the underlying common element is that students study content material such as mathematics, history, geography, and science for at least 50 percent of the school day using French, a language which they are also simultaneously learning. Learning through the medium of a second language (L2) is certainly not a new phenomenon, but a number of characteristics combine to make immersion education different from other forms of bilingual education. In addition to the L2 being a medium of instruction, a number of further characteristics, discussed in Swain and Johnson (1997), identify the Canadian immersion curriculum:

- The immersion curriculum parallels the local L1 curriculum;
- Overt support exists for the L1;
- The classroom culture is that of the local L1 community;
- Students enter with similar (and limited) levels of L2 proficiency;
- Exposure to the L2 is largely confined to the classroom;
- The teachers are bilingual;
- The program aims for additive bilingualism.

There are presently over 300,000 students enrolled in elementary or secondary French immersion programs in Canada (Office of the Commissioner of Official Languages 1996).

French immersion programs have prospered in Canada for over three decades, fostered by the educational, political, and economic motives of those involved. Simultaneously, research has contributed to the growth and development of FI by allaying the fears of anxious parents and educators with its positive findings (e.g., Genesee 1987, Lambert and Tucker 1972, Swain and Lapkin 1982) and by enhancing our understanding of aspects of second language acquisition and applied linguistics.

CONTRIBUTIONS OF FI RESEARCH TO APPLIED LINGUISTICS

The major contributions of FI research to the field of applied linguistics have been threefold. First, immersion education has heightened our recognition of the influence of societal conditions on the outcomes of bilingual education, in particular, of the importance of the distinction between minority and majority language groups. But it has also shown how a particular model of bilingual education can be adapted and extended by different groups in society to serve their own particular purposes. Johnson and Swain (1997) provide examples of immersion being used outside Canada by majority language groups to learn a minority language (e.g., Swedish in Finland), a foreign language (e.g., French in Australia), or a language of power (e.g., English in Singapore), and by minority groups for language revival and language support (e.g., Basque in Spain).

Second, the contributions of disciplinary knowledge and related research paradigms to applied linguistics have been amply demonstrated in the FI research literature. Recent work has drawn on a variety of disciplines, for example, linguistics (Warden 1997), psycholinguistics (Harley and Hart 1997), sociolinguistics (Tarone and Swain 1995), anthropology (Weber and Tardif 1991), and education (Kowal 1997). Correlational (Rehner and Mougeon in press), experimental (Day and Shapson 1991), observational (Lyster and Ranta 1997), and ethnographic and case study (Dagenais and Day 1998; in press) methodologies have all been used in reaching a deeper understanding of the processes and products of FI education.

Third, French immersion research has contributed directly to various subfields of applied linguistics. An annotated bibliography published by the Canadian Association of Immersion Teachers (CAIT) documents the range of issues which have been investigated concerning FI education in Canada. Tardif and Gauvin (1995) list theses and research projects that have been conducted between 1988 and 1994 by researchers based at Canadian universities. Recent research includes contributions to language policy (e.g., Hart, Lapkin and Swain 1998, Turnbull, Lapkin, Hart and Swain 1998), second language pedagogy (see Lyster 1995 and Harley 1998a for recent reviews; see also Swain 1996), and SLA. Its contributions to SLA form the basis of the next section.

CONTRIBUTIONS OF FI RESEARCH TO SLA

FI research has added to our understanding of SLA in several important ways. I will consider these under the following headings: 1) output and SLA; 2) negative feedback and SLA; 3) focus on form and SLA; 4) the role of L1 and SLA; 5) age and SLA; and 6) language testing and SLA. Immersion research provides a more controlled environment in which to study pedagogical issues than is typically the case in ESL research where outside exposure to the language may overwhelm classroom effects. This control gives added weight to immersion findings.

1. Output and SLA

The notion that output, not just input, is important for SLA derives largely from the research in FI. Across a number of studies, it has been shown that, in spite of considerable amounts of rich comprehensible input, immersion students' otherwise fluent oral and written French is markedly non-native, most obviously in its grammatical features. Swain (1985) suggested that this may be due, in part, to the relatively few opportunities students have to use their French: Producing French may force learners to pay more attention to (or to notice) how the language is used to express one's intended meaning than does comprehending it. That is, while attempting to produce the target language, learners may notice that they do not know how to say (or write) precisely the meaning they wish to convey, bringing to their attention something they need to discover about their second language. This need to know, in turn, triggers cognitive processes that might generate new linguistic knowledge or consolidate their existing knowledge (Swain 1995, Swain and Lapkin 1995).

Supporting evidence for this claim comes from an observational study conducted in three grade-two FI classes (Netten and Spain 1989). Of the three classes, one class (Class A) had a low average scholastic ability score (54th percentile) relative to the other two classes, yet performed unexpectedly well on a test of French reading comprehension and much better than Class C whose average scholastic ability score was much higher (73rd percentile). Observations in these classes revealed that, in Class A, students "...were constantly using, and experimenting with, the second language as they engaged in communications of an academic and social nature with their peers and the teacher...," whereas in Class C, students "...had limited opportunities to use the second language to engage in real communication acts" (1989:494).

A second way in which producing language may serve the language learning process is through hypothesis formation and testing. Swain and Lapkin (1995) provide examples in which grade-eight FI learners used their output as a means of trying out new language forms (hypotheses) in situations in which feedback from external sources was not available; thus, there was nothing to test their hypotheses against except their own internalized knowledge. In more usual circumstances, however, learners are able to obtain information from external sources about the accuracy of their hypotheses, leading them to modify their output. Swain (1993) suggested that this modified (reprocessed) output may be considered to represent the leading edge of a learner's interlanguage.

A third function of output is its metalinguistic function—learners use language to reflect on their own, or others', language use (Swain 1995). This metatalk is a surfacing of language used to solve linguistic problems encountered during language production, and, as such, represents language used for the cognitive purposes of learning language. Metatalk surfaces naturally when students collaborate on language production tasks (Swain and Lapkin 1998).

The above perspective on output has been instrumental in determining the sort of exploratory studies conducted recently in French immersion classes by researchers at the Ontario Institute for Studies in Education of the University of Toronto (OISE/UT) (Kowal 1997; 1998, Kowal and Swain 1994; 1997, LaPierre 1994, Spielman to appear, Swain 1998a; 1998b, Swain and Lapkin 1998). In these studies, we have begun to try out in grade-seven and grade-eight FI classes different tasks that are communicatively oriented, but in which communication is, in part at least, about language; that is, students engage in tasks in which they will talk about—and consciously reflect on—their own output. Our findings provide evidence that the metatalk students engage in represents second language learning in progress. In these studies, later language use has been traced back to dialogues occurring as the students worked collaboratively to express their intended meaning and carry out the language production task at hand. The study of the roles of output in SLA has thus evolved into the study of collaborative dialogue: These dialogues (in the first language or target language) engage speakers in linguistic problem solving and knowledge building (Swain in press).

2. Negative feedback and SLA

Lyster (1998a; 1998b; 1999, Lyster and Ranta 1997) has carried out a set of descriptive studies in primary (grades four and five) FI classes. His main purpose has been to identify different ways in which teachers provide corrective feedback to their students and the effectiveness of these types of feedback as indicated by immediate learner repair (uptake). His data (consisting of over 900 error sequences in 18 hours of recordings of French language arts and content classes) reveal that these FI teachers used a number of different correction techniques: recasts, explicit corrections, and what Lyster labels "negotiations of form" (i.e., elicitations, metalinguistic clues, clarification requests, and repetitions of error). Negotiation of form techniques "push" learners to reprocess their output; that is, teachers guide their students to draw on their own resources and repair their own (or other's) errors, thus actively engaging students.

Lyster examined which type of corrective feedback tended to be used with different types of student errors (grammatical, lexical, or phonological), and which type of feedback was most likely to lead to student uptake. He found that negotiation of form tended to follow lexical errors, while recasts tended to follow grammatical and phonologicial errors. Interestingly, negotiation of form led to more frequent immediate repair by learners than recasts or explicit corrections for lexical and grammatical errors. Phonological repairs, however, were more likely to follow recasts, suggesting that the various types of negative feedback may be differentially effective for different types of errors.

Lyster examined further the recasts (377 in all) in his classroom-based data, comparing their pragmatic functions to the teachers' much more frequent use of noncorrective repetition. His findings led him to question the potential of recasts to be noticed as negative feedback by students in these FI classes. Specifically, Lyster found that "...recasts and noncorrective repetition fulfill identical functions distributed in equal proportions" (1998b: 51). Furthermore, unlike other forms of negative feedback, recasts included indications of teacher approval (positive response to the content of students' ill-formed utterances) in a little over one quarter of all recasts. Approval also accompanied the same proportion of noncorrective repetitions and teacher topic-continuation moves immediately following errors when no corrective feedback was provided.

Lapkin and Swain (1996) also describe their observations in an immersion class. They were interested in examining how the teacher integrated language (particulary vocabulary) and content teaching. In this grade-eight class, while teaching a science lesson, the teacher pushed his students to make accurate and sophisticated use of target words and associated grammatical constructions. The corrective feedback provided in the context of this science lesson facilitated the students' attempts to express what they wanted to say at the very moment they were struggling to produce it, a particularly useful time to support language learning (Lightbown 1998). The reason we asked this teacher if we could observe in his class was because his students had outperformed students in other classes in French, all of whom were part of a large-scale evaluation of 26 grade-eight immersion classes (Lapkin, Hart and Swain 1991).

3. Focus on form and SLA

Each of the studies considered under the previous two headings could also be considered under this more general heading: Output and negative feedback are both thought to play a role in SLA precisely because they lead learners' to notice and attend to language form. Several additional studies have also considered this phenomenon. These studies differ from those mentioned above in that curriculum materials with form emphases were prepared in advance and were used to teach FI students over a prolonged period of time. The instructional materials emphasized a focus on form through enhanced input, drew particular attention to form/function links, ensured that students had opportunities to produce the language feature being focused on through group work and collaborative learning, and provided students with feedback about the correctness of their language use. The performance of FI students receiving the focused instruction has been compared with other FI students who did not receive it using oral and written pre-, post-, and delayed post-tests.

A number of early experiments followed this paradigm. Harley (1989) provided grade-six FI students with focused input and output opportunities over an eight-week period to promote the perception and accurate use of form/meaning distinctions between the imperfect and the compound past verb tenses. Day and Shapson (1991; 1996) focused on teaching grade-seven FI students the use of the conditional in hypothetical situations and in polite requests over a six-week period. Lyster (1994) focused on teaching grade-eight FI students sociolinguistic aspects of French over a five-week period. Findings are consistent in showing superior results with the experimental groups relative to the comparison groups. However, sometimes the superiority was not maintained in the long run, or was not evident for all measures.

More recent experiments include Harley (1998b), Harley, Howard and Hart (1998) and Warden (1997); the focus of instruction for these studies was grammatical gender at grades two and eleven respectively. Harley's study suggests that a focus on form can have an impact even on young children. The instructional materials included a variety of children's games designed so that success depended on getting the gender right. For example, students played "Simon Says" in which they performed contrasting actions according to the gender of the noun they heard. The treatment extended over a five-week period for about 20 minutes a day. The results showed that the students in the experimental classes became more accurate in assigning gender to familiar nouns than did the comparison students. However, the experimental students were not able to assign the correct gender to unknown nouns based on their characteristic endings, suggesting item learning rather than system learning. Harley (1998b) suggests that, perhaps because so many new words were presented to the children, they were preoccupied with learning and remembering their meaning and were thus unable to pay full attention to the formal aspects that were the intended focus of the experimental treatment. Perhaps, too, "learners base their formal generalizations on prototypical items rather than on a plurality of items, as was the assumption in this study" (Harley 1998b:170).

In Warden's (1997) study with grade-eleven students, the treatment was quite different, and one more appropriate for older students. Also, the issue was not so much a preventive one, but rather one of reversing fossilization: Gender errors were still prevalent in the spoken and written French of these grade-eleven students. The treatment period lasted approximately eight weeks and consisted of form-focused activities designed to make the students aware of word-ending regularities which serve as clues to the gender of French nouns and provide opportunities to use gender markings correctly. Activities included working in groups to find nouns in the dictionary with specific endings and creating and playing games focusing on gender. The experimental students' performance was superior to that of comparison students on discrete-point tests of grammatical gender, but not in a writing assignment or speaking task. However, a fine-grained analysis of the written assignment showed that the experimental students had become more accurate on the nouns whose specific endings were included in the treatment activities.

Overall, the set of experiments conducted in FI classes suggests that there is value in focusing on language form through the use of pre-planned curriculum materials in the context of content-based language learning. Yet, there are indications that if we knew more about how students were processing the target language while engaging in the activities, we might be better able to structure the learning materials. One route to such understanding is to listen to learners as they talk with each other while carrying out specific activities. Their collaborative dialogues can be a source of considerable insight (Spielman to appear, Swain in press).

4. The role of L1 and SLA

The role of L1 in SLA is typically considered from the perspective of its positive or negative influence on target language use. Harley (1992), for example, has examined patterns of French language development with cross-sectional samples of grade-one, -four, and -ten FI students. She focused on the French verb system and found considerable transfer from English in the students' production. Students tended to assume not only equivalence in verb meaning across English and French, but also in the constructions that verbs enter into. As Wright (1996) demonstrated with grade-four and grade-five FI students, increasing exposure to verbs through reading materials and related analytical activities, including explicit discussion of L1-L2 contrasts, may lead to lasting improvement in the use of the target verbs.

A different perspective on the role of the L1 in SLA is reflected in our own ongoing research with FI immersion grade-eight students as they work collaboratively on language-focused communicatively-oriented tasks (Swain 1999). As they do so, the students often use English, their L1. We have examined the transcripts of student pairs in an attempt to understand their use of L1. Working from the data, we have isolated three categories of L1 use: 1) using L1 to move the task along (working out the sequencing of the story being reconstructed, comprehending the meaning of parts of the story, and managing the task); 2) using L1 to talk about the L2 (searching for vocabulary, focusing on form, and translating); and 3) using L1 to establish and maintain interpersonal relations (agreeing/ disagreeing and talking off-task). In the case of the first category, students were using their L1 to mediate their understanding of the task, both in its substantive content and in what was required of them to complete the task. In the case of the second category, the L1 was clearly mediating students' learning of French. And in the case of the third category, it would appear that English was being used to create the affective environment needed to get the task done.

5. Age and SLA

A recent study conducted by Harley and Hart (1997) tested the hypothesis that different components of language aptitude (associative memory, memory for text, and analytical ability) come into play in SLA, depending on the age at which second language learning begins. At the time of testing, all students in this study were enrolled in grade-eleven FI classes. Some of the students had begun learning French in grade one (early immersion group), others in grade seven (late immersion group). All students completed a set of L2 proficiency tests (vocabulary recognition, listening comprehension, cloze test, written production task, and an individual oral test). For the early immersion students, memory for text was the main predictor of proficiency scores; whereas for the late immersion students, analytical ability was the main predictor. These findings suggest that older learners rely on different cognitive abilities than early learners do, with analytical language ability being more closely associated with success in L2 learning for later learners. Additionally, as the L2 proficiency results of the younger and older learners were not substantially different, the results support other evidence that older learners are more efficient learners than younger learners (e.g., Genesee 1981) and do not support the contention (e.g., Felix 1985) that analytic, problem-solving abilities of older learners will interfere with their L2 learning success.

6. Language testing and SLA

Recently the interfaces between SLA and language testing have been questioned and explored in some detail by Bachman and Cohen (1998). In conducting our FI classroom-based research (e.g., Swain and Lapkin 1998), we have come to the full realization that tests used in SLA research can at best measure what researchers assume students will learn from a teacher's or researcher's intervention. However, what students actually learn may be quite different and will depend on a number of factors, including the learner's current knowledge and affective state. Although the tasks we used in our research encouraged students to pay attention to accuracy and form-function links, the students established their own goals and agenda as to what they focused on. Thus, it would seem crucial, if we are to measure the learning that occurs as a result of the research "treatment," that we tailor our tests to what happens during that treatment. Some of this adapting can be uncovered in the dialogue of students as they interact with their peers during task performance, providing insight into what it is that students do and do not know, and how they come to know it—the real goal of SLA research.

OBSTACLES TO FURTHER FI RESEARCH IN CANADA

Given the political situation in Canada three decades ago, the innovative FI immersion programs appeared promising as a way to reduce the gap between Canada's two linguistic and cultural solitudes. The federal government was interested in supporting their growth, and it, along with provincial governments across Canada which were concerned about the educational implications of FI, provided the financial support for many program evaluations and related research. However, recent decades have brought political change. The issues are complex and have much to do with Quebec's current moves to separate from the rest of Canada in order to preserve its linguistic and cultural distinctiveness. In this political climate, the goodwill which led many Anglophone parents to enroll their children in FI programs appears to be waning, and enrollments in FI programs have leveled off after a long period of continuous growth. Even the interest of the federal and provincial governments has decreased, as indicated by the considerably reduced amounts of financial support given to subsidize FI programs and to continue research projects. So, as perhaps with any innovation, the biggest threat to its continued existence is its "normalcy." FI programs have become a regular, accepted type of education in Canada, and although pedagogical and political issues still provide a background to their existence, they are no longer seen as exceptional with respect to their challenges, problems, and difficulties. As a result, it is more and more difficult to persuade funders that FI holds considerable promise in furthering our understanding of second language learning and teaching.

CONTRIBUTIONS OF FI RESEARCH IN THE COMING DECADE

Of course, it is impossible to predict with any certainty the contributions of FI research in the coming decade. However, I think it is likely that the studies reviewed in this chapter have paved the way for further research which will contribute in particular to our understanding of second language teaching and learning processes.

Lyster plans to follow up his classroom observational work with experimental studies: "*nous reconnaissons que l'effet de la négociation de la forme sur l'apprentissage du français langue seconde reste encore à démontrer et à préciser experimentalement*" (1999:378). [We recognize that the effect of negotiation of form on the learning of French as a second language still remains to be demonstrated with experimental rigour.] Harley is continuing her investigations of second language processing at different ages. For our part, we intend to continue to pay close attention to what learners say to each other as they carry out different tasks. Using stimulated recall and more precise measuring instruments, we hope to refine our understanding of FI students' perceptions of French and how they learn it. Our long-term goal, as with other FI teachers and researchers, is to enhance the learning context for FI immersion students.

There is other research that needs to be done. For example, given the origins of FI in Canada, it is important to know what use immersion graduates are making of their French in the workplace and in social situations with francophones (cf. MacFarlane and Wesche 1995)—we need to understand the "fit" between the reality of FI instruction and the expectation that FI would help to close the gap between Canada's English and French solitudes. And, we need to ask what has been the effect of immersion education in Quebec compared to the rest of Canada. These are highly complex and politically charged questions in the Canada of today, and having some answers would contribute to the growing discipline of applied linguistics.

NOTES

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A CRITICAL REVIEW OF THE CRITICAL PERIOD RESEARCH

Thomas Scovel

INTRODUCTION: THE CPH AND APPLIED LINGUISTICS

Two decades of international research in applied linguistics provides a large number and variety of topics from which to choose for this special anniversary edition, but certainly one of the most significant among these choices is the critical period hypothesis (CPH). Few topics in applied linguistics have continued to captivate the interests of researchers and practitioners so intensively and for such a long period of time as the CPH. Indeed, one could easily go back to reviewing three, not two decades of sustained research and continuous interest in this topic (Lenneberg 1967, Scovel 1969). If number and diversity of publications is indicative, the CPH has engendered even more interest and controversy now than in any previous decade. Why is this so?

First and foremost, for the general public, and for language learners and teachers in particular, the CPH taps an inherent fascination with perceived and real contrasts between young children and adults, a fascination which has given birth to the pervasive "the younger, the better" myth concerning second language acquisition (SLA). Although even proponents of at least some version of the CPH have attempted to dispute or at least qualify this belief (Scovel in press), its profuse popularity has fueled general interest in any evidence which suggests that younger learners are more successful than their adult counterparts. This public interest is encouraged by a constant stream of articles and stories in the media, often attributing the reputed linguistic precocity of infants to developmental neurology (Spinney 1999). This myth has also continued to encourage language teachers who believe that one of the best ways to teach a second language to older learners is to attempt to replicate child language acquisition. In fact, more than any other area of applied linguistics, the CPH has directly or indirectly led to the development of methods for teaching foreign languages. Finally, this conviction that younger is better has had an enormous impact on language planning over the past twenty years, where many countries have introduced English at earlier and earlier grade levels in the belief that this policy will ensure a pool of fluent ESL speakers in the future. Given the pervasiveness of this general interest then, perhaps no topic in applied linguistics so directly affects the popular consciousness and public policy than the CPH.

Among applied linguists themselves, especially those with a specific interest in SLA, the CPH has been and remains a seminal topic. Long (1999) has claimed that research on the critical period has been "critical" to all SLA theory construction. Bialystok and Hakuta write, "The debate over the critical period hypothesis embodies some of the most basic questions about second language acquisition, and indeed, language acquisition in general" (1999:163). And Birdsong talks about "...the unmistakable centrality of the CPH..." to SLA research (1999a:18). Virtually all introductions to SLA devote at least some discussion to CPH research (Cook 1991, Ellis 1994, Larsen-Freeman and Long 1991, Skehan 1998), and over the past twenty years, scores of articles have been published reporting on experiments which supposedly support, refine, or refute the hypothesis. Additionally, there have been several texts and anthologies which have focused specifically on the topic (Birdsong 1999b, Harley 1986, Krashen, Scarcella and Long 1982, Scovel 1988, Singleton and Lengyel 1995, Strotzer 1994).

INITIAL CLAIMS CONCERNING THE CPH

The early work on the CPH was not done by applied linguistics, but it can certainly still be considered as representative of linguistics applied. Though many scholars had written about the apparent advantages that young children enjoy in SLA, Penfield (1963), a Canadian neurosurgeon, was the first to link 'the earlier, the better' view of foreign language learning to the plasticity of a child's developing brain. Because of his frequent public presentations and writings advocating early foreign language exposure, Penfield could justly be considered the father of immersion programs in Canada, thus demonstrating how even early on, the CPH has influenced foreign language pedagogy. Due to the relatively limited knowledge about developmental neurology forty years ago, and due to his own over enthusiastic promulgation of 'the earlier, the better' approach to foreign language teaching, Penfield's contributions have diminished with time. They did serve, however, to encourage Lenneberg, a psycholinguist, to explore the relationship between age and acquisition more intensively. Lenneberg (1967) examined a wide number of brain changes in early life and correlated these with maturational milestones in child development, especially the development of speech and language. It was he who suggested that puberty was the approximate cutoff age for completely successful primary language acquisition and, furthermore, that this was the age when foreign accents emerged. Scovel (1969) summarized and narrowed Penfield's and Lenneberg's views on the CPH into three essential claims: 1) that adult native speakers can identify non-natives by their accent immediately and accurately, 2) that loss of brain plasticity at about the age of puberty accounts for the emergence of foreign accents, and 3) that a CPH is tenable only for speech (a native accent) and does not ultimately affect other areas of linguistic competence. Intensive research since that time, especially during the past twenty years, has refined these claims and has greatly broadened this initial base of inquiry. Over the past twenty years, applied linguists, especially those who specialize in SLA research, have attempted to resolve the following issues concerning the CPH.

1. Does the preponderance of evidence support the CPH?
2. Is there a CP for acquiring accentless speech?
3. Is there a CP for morphosyntactic competence?
4. If the answers to (1) and either or both (2) and (3) are affirmative, how can age-related differences be explained?

DOES THE PREPONDERANCE OF EVIDENCE SUPPORT THE CPH?

Since this question is the most central one of all, and since it entails the answers and the evidence encapsulated in the three other questions which have just been introduced, it is important to define the scope of this first question. Avoided here is a discussion of the differences that may exist between primary (mother tongue) language learning and the acquisition of an additional (second) language. This review focuses only on age-related constraints on second language acquisition. Still, it should be acknowledged that these constraints may be very similar to CP limitations on first language acquisition. Any discussion of age-related constraints on primary language learning introduces a host of additional topics, however, among them the evolution of animal communication (Hauser 1996), the uniqueness of human speech (Lieberman 1991), and studies of feral children and the so-called "linguistic apes" (Candland 1993, Savage-Rumbaugh, Shanker and Taylor 1998). Also avoided here, for a variety of reasons, will be a discussion of the exact age at which a CP ostensibly ends. For most studies, the CP is loosely defined as the period of time between birth and puberty, but there are several problems in demarcating puberty chronologically (Scovel 1988: Chapter 3). Additionally, there is great variation among researchers on which age spans they use to divide up their subjects, and there may be multiple critical periods at varying age levels for different linguistic modalities, a possibility raised early on by Seliger (1978) and discussed more recently by Eubank and Gregg (1999).

More than twenty years ago, several studies had already suggested that children were not necessarily superior to older learners in acquiring a second language, not even in the area of pronunciation (Olsen and Samuels 1973, Snow and Hoefnagel-Hohle 1978). The majority of researchers seemed skeptical about the existence of a CP (Clark and Clark 1977, McLaughlin 1978), and several explicitly denied its existence (Neufeld 1980, van Els, Bongaerts, Extra, van Os and Janssen-Dieten 1984). It is also important to point out that at that time, with the rare exception of a few studies (Patkowski 1980), virtually all of the discussion focused on the ability of post-pubescent learners to acquire native-like speech. Indeed, several of these early studies on the emergence of foreign accents spawned new methods of foreign language teaching for adults. For example, Asher and

Garcia's (1969) survey eventually led to the development of Total Physical Response, and Krashen's (1973) paper laid the foundation for his well-known contrast between "learning" and "acquisition" which led to the evolution of the Natural Approach.

Now, more than twenty years later, it is my impression that, based on a general reading of the relevant literature in applied linguistics and psycholinguistics (especially writers such as Long [1990] and Pinker [1994]), the belief in some version of the CPH presently represents the majority opinion. Furthermore, this opinion seems buttressed by a constant succession of new research supporting some aspect of the CPH (Major 1999, Spadaro 1998). Conversely, skeptics like Bialystok and Hakuta (1999) and Bongaerts (1999) now appear to represent the minority view on this subject. If this cursory answer to the first question regarding the CPH is at all accurate, a major shift in thinking has taken place at the end of the century on a topic of significant import to applied linguistics.

IS THERE A CP FOR ACQUIRING ACCENTLESS SPEECH?

Recall that one of the earliest claims made about the CPH, based on the initial work of Penfield and Lenneberg, was the presumption that a CP existed only for 'speech' and not for 'language' (Scovel 1969). That is, the original speculations about the existence of a biologically based CP in humans that would be homologous to the profuse and well-documented manifestations of CP's in animal behavior concerned the ability to sound like a native speaker. A proliferation of early studies appeared to document the existence of a CP for human speech; language learned after puberty invariably could be identified as non-native by native speakers of that target language (Asher and Garcia 1969, Fathman 1975, Flege, Munro and MacKay 1995, Harada 1997, Major 1987, Oyama 1976, Seliger, Krashen and Ladefoged 1975, Tahta, Wood and Lowenthal 1981). Studies also suggest that bottom/up measures of a foreign accent (e.g., voice onset timing) correlate with more global, top/down judgments (e.g., "Does this person sound like a native speaker?") (Major 1987, Riney and Takagi 1999). Irrespective of how these results are interpreted, the answer to the second question appears to be resoundingly affirmative. Nevertheless, some of those who hold to the minority view on the first question do so because they believe they have evidence that the answer to this second query is negative. That is, some researchers believe that there are people who can learn a new language after puberty without any trace of a foreign accent.

Several applied linguists have devoted their attention to experiments which are designed to train (or to find) post-pubescent learners of a second language who can pass themselves off as native speakers of that target language to native-speaking judges. Neufeld and Schneiderman (1980) attempted to train a group of English speakers to speak a few brief phrases in three different languages so that they would sound like native speakers, and the authors concluded they were essentially successful in this endeavor. However, serious criticisms have been levied about their experimental design and the interpretation of their results (Scovel 1988). A more elegant study was performed by Bongaerts and his colleagues (Bongaerts, Planken and Schils 1995) using, among other groups of speakers, a number of highly proficient post-pubescent Dutch speakers of English, but the results of this experiment are vitiated by the fact that the judges, who were native speakers of British English, had difficulty consistently identifying even the native speaking controls (Scovel 1997). Bongaerts (1999) has reported a more recent and convincing set of experiments in which highly proficient Dutch speakers of French have been identified as speaking with a native accent by native speaking French judges. Even though only a few of the participants in these experiments were able to speak "accentless" French, they appear to be exceptions to the strong version of the CPH for speech espoused by Scovel (1969). Similarly, an exceptional adult learner is discussed by Ioup, *et al.* (1994): They describe an English speaker who first began to learn Egyptian Arabic at the age of twenty-one and eventually acquired such a high proficiency that she was consistently identified as a native speaker. And a more recent study of 24 adult, English-speaking learners highly proficient in German suggests that at least one of the subjects was judged to have native-like pronunciation in his second language (Moyer 1999).

Studies such as these force us to reconsider the answer to question two. It may be that for the vast majority of adult language learners, a native-like accent remains impossible. But for all natural populations, exceptions abound, and these rare examples of precocious pronunciation may represent the exceptions found within plus two or three standard deviations from the norm as speculated by Scovel (1988).

Despite the fact that foreign accents emerge in early adulthood and, with rare exception, remain indelible after puberty, adult learners can, should, and do improve their pronunciation and intelligibility in a second language. Applied linguists who have been influenced by work on the CPH have made promising contributions to this particular area of SLA (Derwing, Munro and Wiebe 1998, Munro and Derwing 1995).

IS THERE A CP FOR MORPHOSYNTACTIC COMPETENCE?

Except for Penfield (1963), most of the early research on the CPH was confined to exploring possible CP effects on pronunciation. Penfield alone was a proponent of 'the earlier, the better' claim and assumed that young children were superior to adults in all aspects of SLA. But beginning with Patkowski (1980), there have been several studies conducted which appear to muster increasing evidence that age constraints may also affect morphosyntactic competence (Coppetiers 1987, Johnson and Newport 1989, Shim 1995, Spadaro 1998, White and Genesee 1996). It is instructive to point out that unlike the pronunciation research, which focused almost exclusively on binary or N-ary judgements by native speakers of the target language whether or not taped subjects spoke with a foreign accent, these morphosyntactic studies tap a range of abilities in both performance and competence (e.g., accurate use of irregular morphological inflections, accurate and fluent use of idiomatic lexical collocations, and ability to make accurate grammaticality judgments). It is therefore immediately obvious that at least two major differences exist between the phonological work on the CPH and experiments dealing with lexical and grammatical knowledge. The former relies solely on the linguistic performance of non-native speakers, while the latter depends on tapping skills in both performance and competence in the target language. Second, as Scovel (1988) has pointed out, the former provides evidence for a CP for speech; the latter supports the notion that there is a CP for language.

Because the grammaticality-judgment research has garnered the most attention (e.g., the Johnson and Newport [1989] study is the single most cited reference for the CPH in the SLA literature), and because this research paradigm used in applied linguistics is the one most directly related to research in formal linguistics, it seems fair to examine it most critically. Several authors have lodged a variety of criticisms about either the use of grammaticality judgments in SLA or the interpretation of the results of such studies (Birdsong 1992, Eubank and Gregg 1999, Scovel 1988). In addition, a study undertaken by Slavoff and Johnson (1995) quite surprisingly found no differences between younger learners (7–9) and children close to or into the age of puberty (10–12) in a replication of the earlier, well-known work by Johnson and Newport. The authors also found an unanticipated but significant gender effect with girls outperforming boys. All of this adds support to the suspicion that grammaticality judgment tasks tap a type of target language competence which is difficult to correlate with hypotheses about a CP. Finally, going back to the larger issue of the use of grammaticality judgments as a source of evidence for native speaking competence, many formal linguists hold serious reservations about this particular mode of linguistic inquiry (Schutze 1996).

HOW CAN AGE-RELATED DIFFERENCES IN SLA BE EXPLAINED?

Over the past twenty years, probably the greatest shift in direction in the debate about the CPH has been from the issue of whether or not age-related differences in SLA do indeed exist, to the question of what actually accounts for the attested discrepancies between child and adult second language learners. Here is where the greatest disagreement emerges among the many researchers who are attracted by this area of applied linguistic inquiry. In a telling metaphor, McLaughlin, referring to Hegel's description of Schelling's philosophy, has aptly described this murky arena of explanation as "a night where all cows are black" (McLaughlin 1978:59)!

Because the whole notion of critical periods comes directly from biology (both from genetics and from ethology), the original application of the term to language has strong biological underpinnings. This orientation is especially evident in the early work explaining the emergence of foreign accents as being linked to the completion of lateralization (hence brain plasticity) by the age of puberty (Lenneberg 1967, Scovel 1969). In a narrow sense, therefore, a CP for

SLA can only be viewed as a biologically based explanation for the emergence of non-native speech and/or language after about the first decade of life. Because only pronunciation has a clear neuromotor etiology, it alone is affected by the loss of plasticity, evidenced in part by the completion of cerebral lateralization at the emergence of puberty. Note that this biologically based explanation for a CP speech does not seem to explain why there might very well be a CP for the acquisition of native-like morphosyntax as well.

Krashen (1973) was the first to criticize this biologically based explanation. From his interpretation of the neurological data, Krashen argued that lateralization (and brain plasticity) was completed at about the age of four, and so, if age constraints exist for SLA, they are not due to developmental neurology. Krashen's reinterpretation of the neurological data has itself been critiqued (Scovel 1988), and there has been a great deal of new evidence supporting the claim that the plasticity of the developing brain provides children with unique opportunities for learning up to the end of the first decade of life (Spreen, Risser and Edgell 1995: Chapter 8). Note, however, that a biological explanation for age constraints in SLA is not nearly as adequate in accounting for any limits in morphosyntactic learning by older adults. As has been already intimated, it is difficult to see how highly abstract concepts such as irregular morphology or the subjacency principle would be directly linked to loss of neuromuscular plasticity. Nevertheless, if we assume that all humans are born with an innate awareness of certain linguistic principles (UG), how can we account for age constraints in morphosyntax? A variety of explanations have been offered.

Several formal linguists believe that, for reasons not yet determined, UG is dismantled at about the age of puberty and therefore older learners lose their "natural" ability to acquire nativelike language competence (Bever 1981, Pinker 1994). On the other hand, Newport (1990) suggests that the relative cognitive immaturity of pre-pubescent children prevents them from over-analyzing the language(s) they are learning and helps contribute to native-like accuracy. Note that this explanation is quite similar to Krashen's claim that children 'acquire' language, but adults tend to "learn" a new language. Bialystok and Hakuta (1999) voice a similar argument in their summary of the most massive study of age effects on second language learning (over 60,000 subjects). They claim that maturational factors and education continually intervene in ultimate SLA success, and so it is misleading to invoke biological explanations such as the CPH for limitations that appear in older second language learners. Finally, there are those such as Birdsong (1999a), who believe that there is nothing "critical" about pubescence and that, as far as morphosyntactic learning is concerned, an earlier age of exposure to a new language is always advantageous, even with adult learners.

SUMMARY

To return to the opening theme of this review, no single area of applied linguistics seems to be as pertinent to non-linguists and to public policy makers as the CPH, and by now, it should be equally apparent that research in this area has a long, diverse, and somewhat controversial history. From this review, it should be apparent that perspectives on the topic have shifted over the past twenty to thirty years thanks to the informative work by applied linguists and by scholars from other fields who have applied their expertise to this area of language behavior. It should also be obvious that, given the conflicting evidence and contrasting viewpoints that still exist, parents, educational institutions, or ministries of education should be exceedingly cautious about translating what they read about the CPH research into personal practice or public policy. If applied linguists have learned anything at this important juncture in history, we have learned to look at the critical period hypothesis a bit more critically.

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PSYCHOLINGUISTICS IN APPLIED LINGUISTICS: TRENDS AND PERSPECTIVES

Kees de Bot

INTRODUCTION

This article addresses the relationship between two major terms, psycholinguistics and applied linguistics, and in the process, explores key issues in multilingual processing. A straightforward definition of psycholinguistics is provided by Kess (1991:1): "The field of study concerned with psychological aspects of language studies." In the last decade, the definition has become more restricted, leaving out more social-psychological aspects like the study of attitudes in language use. Here, psycholinguistics will be further restricted to the study of processes of language production and perception (as opposed to acquisition and attrition).

Defining what applied linguistics (AL) is at the moment is less straightforward,[1] particularly when the simple interpretation of the application of linguistic theory is abandoned. In Europe, AL as a label for a whole field, is now gradually losing ground to the more general label 'Applied Language Studies.' This change of emphasis reflects a distancing from structural linguistics and an awareness that there is more to be known about language that is applied than just linguistics. Looking at the role of linguistics itself in studies on cognitive processing, there is a clear preference for Lexical Functional Grammar over other models (e.g., Levelt 1989, Pienemann 1998). In particular, the more recent minimalist approach in generative grammar seems to have lost contact with the study of language acquisition and language use, while earlier L2 research based on the principles and parameters model has lost contact with more recent theoretical developments (Cook 1997).

RELATING PSYCHOLINGUISTICS AND APPLIED LINGUISTICS

If we want to clarify the role psycholinguistics can or should play in AL, we need to narrow down the definition of the latter, or rather look at only a part of that vast field. *The acquisition and use of a second language* seem to be the appropriate chunk of AL in this context. This sub-area relates to many other parts of our field, but its core is, in my view at any rate, essentially psycholinguistic in nature. The psycholinguistic interest would be in the processing mechanisms involved in using more than one language and the acquisition of additional languages. The AL interest would be in understanding why language learners behave the way they do, or in other words, what the mechanisms are for L2 use and acquisition. Ultimately, interest also lies in interventions that change and improve those mechanisms. This interpretation means that multilingual processing can be defined as the intersection or shared interest across psycholinguistics and AL. In this intersection, there are many questions to be answered: How are different languages processed? What are the processing mechanisms of cross-linguistic influence? What is the impact of level of proficiency? Is there a limit to the number of languages the system can deal with before breaking down? Are there processing differences between different types of languages? To what extent do socio-psychological factors influence processing mechanisms?

In the last two decades, psycholinguistics, as a sub-field of cognitive science, has seen an enormous growth that cannot be captured in a few pages. Therefore, a selection of topics will be discussed here to show the potential of connecting theories and models from other fields to the psycholinguistic study of multilingual processing. In what follows, I want to concentrate on a few issues that I expect to be high on the psycholinguistic research agenda for the coming decade, including the following: cognitive processes and SLA, socio-psychological factors in language processing, language processing and language testing, sign language and multilingual processing, and the neuro-imaging of multilingual processing. Before addressing each topic in turn, three central issues from the current literature on bilingual processing are noted briefly in order to set the stage.

KEY ISSUES IN THE MULTILINGUAL PROCESSING

1. The structure of the bilingual lexicon

Of all the issues that have been addressed, the structure of the bilingual lexicon is no doubt the main issue in recent years. As surveys of this literature show (cf. Kroll and de Groot 1997), early proposals based on single/dual storage models are too simple and inadequate to explain experimental findings. There now seems to be agreement that a functional view of the lexicon—that is, models that clarify how lexical information can be accessed—is to be preferred. Following proposals by Paradis (1987), the now dominant model assumes that the words from different languages are organized as subsets in lexical memory. These subsets are formed through the co-occurrence of word relations as these words are used together. This process leads to networks of interrelated words. Since the words of specific languages quite naturally tend to be used together, language-specific subsets develop. This concept of the bilingual lexicon clearly is a dynamic one: New words will be added and, through non-use, connections between words will weaken to the point that the network falls apart. (See Meara 1999 for a mathematical approach to structural changes of the lexicon.)

In most models of the (bilingual) lexicon, three levels are distinguished: a conceptual level, a lexical level, and a phonological level. How languages come into play at these three levels raises other major issues: 1) Are there language specific representations on the conceptual level? 2) Are words organized on the basis of language? 3) Are there different sets of phonemes or syllables? None of these issues have really been resolved.

2. Language choice in production and perception

In both production and perception, there must be language specific processing, though the two processes will differ. In perception, characteristics of the input (e.g., sounds that are language specific) will trigger the system to 'expect' input in a given language. (See Grosjean 1997 for an overview of the literature.) Of course, there will also be information in the communicative setting that suggests the use of a particular language. So in perception, language choice is typically both a top-down (setting) and a bottom-up (language characteristics) process. In language production, language choice is essentially a top-down process: The speaker has to include in his/her communicative intention the language in which an utterance has to be encoded. In many situations, it is clear that one specific language has to be selected exclusively for production. In situations in which multilingual speakers are interacting, the use of more than one language is possible and may even be the preferred choice. Language switching can be a communicative tool to highlight specific information or express an attitude towards a topic of conversation. De Bot and Schreuder (1993) propose a 'language cue' to explain the wide variation in code switching that has been reported in the literature. (See also Milroy and Muysken 1995 for a collection of papers on code-switching.) They argue that for many individual switches, no linguistic or socio-psychological explanation can be given and indeed is needed because speakers set the cues for the languages to be used to a certain value, leading to the right mix of language in a given situation. The exact locus of the language cue is still a matter of debate (cf. Poulisse 1997 and Green 1998 for a model in which inhibition plays a crucial role).

3. The language mode

In several publications, Grosjean has developed the idea of a language mode to explain the various ways multilinguals use their languages. The language mode is defined as follows: "The state of activation of the bilingual's languages and language processing mechanisms, at a given point in time." The language mode is a continuum, ranging from a monolingual mode to a bilingual speech mode (Grosjean to appear). In the monolingual mode only one language is activated and the other languages in a multilingual are deactivated. The notion of a language mode is related to the issues of the language cue discussed above: The language mode is defined by the setting and the communicative intentions of a speaker. This is not to say that there is fully conscious control of the position on the mode. Several experimental studies have shown that even in a supposedly monolingual setting, the other language continues to play a role (e.g., in experiments with monolingual and bilingual presentation of stimuli). Results from such studies have shown that, with monolingual presentation of stimuli, there was interference from the other language because the subjects could not completely 'switch off' that language (Dijkstra, van Jaarsveld and ten Brinke 1998). Hermans, Bongaerts, de Bot and Schreuder (1998), carried out an experiment in which they tested the interference of the L1 in L2 experimental tasks. Using a picture word interference task, they assessed the activation over time of form and meaning characteristics. They showed that in the initial stages of activation of an English word, the Dutch name of the picture to be named is also activated. Their data show that bilingual speakers cannot suppress activation of their first language while naming pictures in a foreign language.

The notion of the language mode clearly needs to be developed further. In several descriptions, it seems that language mode is a metaphor for the levels of activation of language-specific subsets in different processing components. It is not clear whether languages as a whole should be activated more, or less, or whether only parts can be active; in other words, can a bilingual operate in a more bilingual mode in the phonological processing unit and in a more monolingual mode for the syntactic unit? Or should they all be on the same place of the continuum? It seems likely that these components are interrelated and activate each other through back-propagation, and the components are probably 'in tune' most of the time, possibly with some delay, depending on the part of the system that makes a request for more information.

In general, the idea that the language mode is a one-dimension continuum is problematic: Mode is a momentary position of an individual speaker in a multi-dimensional space. For all languages, there is a given level of activation, in some situations zero, or close to that; in other situations, much higher, and every position in this multidimensional space is possible, though maybe for very high levels of activity, an as-yet-undefined level of proficiency is called for.

FUTURE DEVELOPMENTS AND NEEDS

1. Cognitive processes and SLA

In the last decade, several researchers have tried to relate cognitive processing to SLA. Richard Towell and his colleagues (Towell and Hawkins 1994, Towell, Hawkins and Bazergui 1996) have been looking at learners of French from the perspective of the Levelt model for quite some time, trying to relate the Chomskyan approach to SLA. Pienemann's (1998) book is a further development of his earlier work on learnability, but it now includes a processing component.

His approach is heavily based on Lexical Functional Grammar and, again, on the Levelt model. His main argument is that processing components and mechanisms put constraints on what can be processed at a specific stage of acquisition. In a recent paper, Doughty (in press) discusses various steps in the processing system and storage systems in language production and perception. Her main interest is to find ways to impact the processing mechanisms through interventions in order to improve language processing in language learners. One of the real issues here is how input is used to change the knowledge in the system. It has been suggested that recasts, corrected versions of learners utterances, may be the best way to change that information because a direct comparison can be made between output and input. This hypothesis opens up a whole discussion that goes beyond the present article. My reading of the psycholinguistic literature on processing leads me to believe that there is never a direct comparison between input and output because the input information is immediately processed and not stored in memory in that form. In language production, words, rules, and elements are drawn from memory at a considerable speed. Therefore, availability of information is an important factor. If we assume that the same storage systems are used for production and perception (as the findings of cross-modal experiments on picture naming with interfering written stimuli seem to suggest), the activation of an element in memory through the perceptual system will be slightly higher for some time, then it decays again. This enhanced level of activation of an element increases the chances of that element being selected again. Selection is always a trade-off between accuracy and speed, and in many situations, a word that may not be the perfect match, but comes very close, may be preferred over the best match, because it is easier to access.

With respect to Doughty's main concern (whether it is possible to have an impact on processing), I take the position that we cannot interfere with the ongoing process, but what we can do is manipulate the selection process. A crucial point is that we cannot erase information from our memory. What we can do, though, is add competing information that for various reasons wins in the rat-race. Thus, to influence processing, another option needs to be made a more attractive candidate in the selection procedure. If a learner systematically matches the wrong word with a concept that he/she wants to express (like 'mourir' rather than 'tuer' in Swain and Lapkin 1995), we need to make another word the better candidate. We cannot do that 'on-line' during the immediate retrieval process, but various lexical tasks in which relevant conceptual and functional aspects of that verb are activated may give this word a 'push,' making it a better match for later processing and, more importantly, one that is accessed more easily. Once we succeed in having this candidate win the competition—every time a successful match is made—the connection between the concept and the related lemma is strengthened, making a correct choice more likely the next time.

If we can manage to turn our understanding of the processes of production and perception into interventions that provide learners with the right information at the exact time they need it, this would represent a real step forward. Given the possibilities of information technology, it is easier now to develop materials and techniques to make such well-timed interventions than it was in the past.

2. Language processing and language testing

While language testers are generally never slow nor reticent to tell the applied linguistic community what their moral standards and research methods should be, the major part of their work on testing language proficiency is basically built on the black box approach prevalent in the behaviorist era. While there now is quite some information on the various subprocesses of language production and language perception, most language testing is still geared towards the outcomes of the whole process. For real diagnostic testing, instruments have to be developed that are specifically aimed at assessing the workings of various subprocesses. In production, things can go wrong in many stages of the process. For example, in phonological encoding, segmental and suprasegmental information have to be combined to develop the phonetic plan. It is more or less known how this takes place, and accordingly, what can go wrong. Testing procedures are needed that will allow us to get specific information about problems in these substages of language production.

3. Socio-psychological factors in language processing

One of the big issues for future research is to determine the extent and the manner in which socio-psychological factors related to the minority status of a language may have an impact on language processing. It is in a way attractive to view our language production system purely as a language producing machine, but this is evidently too simple a picture: lexical access, grammatical complexity, and phonological encoding do not take place in a socio-psychological vacuum. Factors like status, self-esteem, and self consciousness are critical factors in all stages of the production and perception process. To give an example, when, in speaking, a specific word is needed, there will be a process of matching the meaning components of a lexical item and the communicative intention it is supposed to express. In that matching process, there is an evaluative moment in which many factors will come into play. (For example, is this word appropriate or good enough for this communicative situation? Am I using the right level of politeness? If I cannot use this word, should I continue or stop?) There is no absolute or mechanistic device that can make that decision for all words. Of course, not every single word is weighed in such a way in speaking, since that would lead to too much loss of speed. How such social-psychologically motivated mechanisms operate is far from clear, but, in particular for our understanding of language use in language learners, a better understanding of such mechanisms is vital.

4. Sign language and multilingual processing

There is very little research specifically aimed at the study of the bilinguality of sign language. As Padden (1999) points out, very few sign users use that code only. Many language-signers either mouth or even vocalize spoken language and combine sign language with other communicative means, such as additional gestures or facial expressions. Dufour's (1997) overview of the research on sign language and bilingualism shows that some of the research that has been done on the processing of sign language can be reinterpreted in terms of bilingual processing. An example is the study by Siple, Caccamise and Brewer (1982) on the encoding of signs. In this study, deaf and hearing signers with different levels of fluency in signing had to encode signs that differed in formational properties, meaning, and translation in English. Formational properties appeared to play a more important role than the influence of (spoken) English, which suggests an independent storage of signs.

On the basis of the literature available, Dufour (1997) proposes a model of processing in which three levels are distinguished, a conceptual level, a lexical level, and a third level for both (vocal) articulation and signing. One of the problems in Dufour's model is that there is no account of the processing of sign words and finger spelled words. This is not a trivial matter for a processing model. The decision either to use a sign or to finger spell has to be made at a fairly early stage of the production process because different mechanisms are involved. In sign language, there is vocabulary that alternates between finger spelled and signed forms. For example the signed LOVE and the finger spelled LOVE are different in grammatical class: the signed form is a verb and the finger spelled, a noun (Padden, personal communication). This distinction means that in the early stages of encoding, the decision either to sign or finger spell has to be taken. So far, no research seems to have been done on the relation between signing or fingerspelling on the one hand and the other languages (signed or other) of the signing-language user on the other.

Another element that is missing in Dufour's model is the fact that most signers support their signing with mouthing. What aspects of processing exactly are expressed in mouthing is unclear; the impression is that content words are more likely candidates than function words and that new information is highlighted through mouthing more than old information. In addition, some parts of the communicative intention are expressed in a non-verbal way (e.g., through nodding to add negation to a message). Messing (1994) adds a sociolinguistic perspective in her study on bimodal communication, examining the introduction of individual signs into spoken language or individual words into a signed conversation. Her data showed that there are register variations in the mix of spoken and signed language.

The many options signers have, such as switching across sign languages, or between vocal language and sign language, or combining signing and mouthing, present a real challenge for the psycholinguistics of bilingualism. It is obvious that present models of language processing cannot deal with the complexities of signing and bilingualism. An extensive research program will be needed to come closer to an understanding of what our language processing system can do. As Dufour (1997) concludes, "The difference in modalities between signed and spoken languages may have important and critical consequences for our understanding of language representation and processing in the bilingual mind" (p. 327).

5. Neuro-imaging of language processing

In the last two decades, our understanding of the functional organization of the human language capacity has increased enormously. At the same time, various new techniques have been developed to register neuro-physiological processes in the brain. There is a rapidly expanding field of research that aims at relating the cognitive architecture of language and those neurophysiological processes.

> Although the relation between the cognitive architecture and the neural architecture of higher cognitive functions is by no means a simple and direct one, there is a growing awareness among cognitive scientists that they should construct models of cognitive functions in which neurobiological constraints are taken seriously.... The rapidly developing field of cognitive neuroscience is therefore based on the conviction that findings at the neurobiological level of analysis should have real consequences for the psychological analysis, and, similarly, that the results at the psychological level should have substantial implications for our understanding of the neurobiological system (MPI-Booklet for Psycholinguistics 1998).

Different techniques to support this agenda include measures of in-vivo brain activity, including nuclear magnetic resonance imaging (MRI), positron emission tomography (PET-scans) and magnetoencephalography (MEG). These techniques provide information about brain structures and the time course of language-processing events with a high resolution in terms of milliseconds.

Neuro-imaging of bilingual processing is still in its infancy, and even for 'big questions,' such as the neural substrates of individual languages, the more refined techniques have not yet led to real conclusions.[2] While some studies (Klein, *et al.* 1994 and Yetkin, *et al.* 1996) report that the same areas of the brain are used to process L1 and L2, other studies (Dehaene 1997, Kim, *et al.* 1997) report a dissociation of the areas used by the two languages. Here we should refer to Paradis (1997) who warns against simplified over-generalizations with respect to neural substrates of languages. He points out that differences in proficiency may lead to the use of different strategies (e.g., pragmatic vs. lexical) which have been shown to be located in different parts of the brain. In addition, there is evidence that type of bilingualism (early vs. late) has an effect on cognitive processing, even for near native speakers of the second language (Neville, Mills and Lawson 1992). In the future, neuro-imaging may become a useful tool to understand changes in processing that are associated with learning or forgetting, and it may even help us determine whether what we present is actually processed, which brings us close to the input-intake discussion in SLA.

One of the main problems is going to be that, in order to make a real contribution to our understanding of the human-language-processing mechanism, applied linguists have to keep in touch with researchers from other fields, while at the same time these fields are becoming more complex and technically advanced, as experimental techniques and measurement procedures develop further. Bilingualism and SLA are not the prime interest of researchers working in cognitive science and neuro-imaging. If we want to maintain that the study of multilingual processing is at the heart of the study of the human language capacity, we need to become discussion partners informed about new developments and techniques. This requirement means staying current with pretty much a complete field of research apart from one's own.

CONCLUDING REMARKS

From the above, it is obvious that a thorough introduction in psycholinguistics should be part of the training of future applied linguists. Without denying the importance of sociolinguistic and pedagogical issues in SLA, we need to teach and understand foremost the processing mechanisms that play a role in acquisition and use.

There is no simple answer to the question of whether we should develop programs in applied linguistics that take into account developments in cognitive science. There seems to be little point in having programs focused solely on multilingual processing. A set-up in which a major in applied linguistics, with a substantial part of the program devoted to psycholinguistic aspects of bilingualism, combined with a specially tailored minor in cognitive science, may be a solution here, but that will take the applied linguistics program quite far from what for many people working in this field consider to be the core of our field.

One final point is that while psycholinguistics as a field is highly international, it is remarkable that so much of the work on multilingual processing is done in Europe. This pattern probably reflects two tendencies: One is that monolingual researchers will in general be less interested in studying multilingualism than researchers who speak more than one language. The other tendency is that, for the kind of research reported on here, fairly large numbers of multilingual subjects are needed, preferably partly second language learners, and partly foreign language learners. Since the European scene is more multilingual, maybe not so much in numbers as in attitudes and interests, it is likely to carry on more research on multilingualism. Such a trend will, in all likelihood, increase with the current internationalization trends in Europe for at least the next decade.

NOTES

1. At the 1999 Tokyo world congress of AILA (*Association Internationale de Linguistique Appliquée*), several sessions were devoted to somewhat *fin-de-siècle* discussions of what constitutes the field of applied linguistics.

2. The author is indebted to Laura Sabourin for providing him with information about this topic.

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de Groot, A. and J. Kroll (eds.) 1997. *Tutorials in bilingualism: Psycholinguistic perspectives.* Mahwah, NJ: L. Erlbaum.

This edited volume is the most comprehensive set of papers on bilingual processing that is currently available. In particular, the papers by Poulisse, Paradis, Cook, Dufour, and Grosjean are relevant in this context. The introduction by De Groot and Kroll provides a very useful overview of current trends.

Doughty, C. In press. Cognitive underpinnings of focus on form. In P. Robinson (ed.) *Cognition and second language instruction.* Cambridge: Cambridge University Press.

This paper is one of the first to integrate processing mechanisms and SLA with the aim to develop interventions for language learners. The paper covers a wide range of issues related to processing and storage in memory, and usefully relates this information to what we know about SLA.

Green, D. 1998. Mental control of the bilingual lexico-semantic system. *Bilingualism: Language and Cognition.* 1.2.67–82.

This provocative paper builds on Green's long ranging interest in bilingual processing. It proposes an inhibitory control model to explain how bilinguals control their two languages systems. The paper is followed by eight peer comments and the author's reaction to these comments.

Grosjean, F. To appear. The bilingual's language modes. In J. Nicol (ed.) *One mind, two languages: Bilingual language processing.* Oxford, Blackwell.

This paper contains the fullest description of Grosjean's ideas about the Bilingual Language Mode available. Though the concepts used and the

mechanics of how the language mode works in actual processing are not always clear, the idea of a language mode is very compelling, and researchers working on multilingual processing have to at least take a position on this issue.

Levelt, W. J. M. 1989. *Speaking: From intention to articulation.* Cambridge, MA: MIT Press.

While now 10 years old, this book still is as relevant as it was when it came out. It is the only full description of the language production system, integrating information ranging from concept formation to articulation. Its relevance for multilingual processing has been evidenced in many recent articles on multilingualism.

Levelt, W. J. M., *et al.* 1999. A theory of lexical access in speech production. *Behavioral and Brain Sciences.* 22.1.1–75.

This article contains the most recent version of the Levelt model for language production. It is clearly the state of the art in lexical access. This very rich paper is followed by peer commentaries in the BBS-tradition.

Padden, C. 1995. Early bilingual lives of deaf children. In I. Parasnis (ed.) *Cultural and language diversity and the deaf experience.* Cambridge: Cambridge University Press. 99–116.

This is a very useful overview of what makes sign users bilinguals or multilinguals. Based on her own extensive experience in sign language research, Padden describes how the various languages of signers grow and interact.

Pienemann, M. 1998. *Language processing and second language development. Processability Theory.* Amsterdam: J. Benjamins.

In this book, Pienemann describes his Processability Theory, which is based on the idea that constraints of the processing system determine what can be acquired in SLA. This view is in marked contrast with the idea that linguistic aspects, as proposed in formal linguistic theories, determine the order of acquisition in a second language.

Schreuder, R. and B. Weltens (eds.) 1993. *The bilingual lexicon.* Amsterdam: J. Benjamins.

Though the field is moving so fast that some of the papers in this volume are becoming outdated, this edited volume is still one of the few in which various aspects (teaching, testing, acquisition, attrition, and storage) of the bilingual lexicon are brought together, and most of the contributions have not lost much of their relevance.

Towell, R. and R. Hawkins. 1994. *Approaches to second language acquisition.* Clevedon, UK: Multilingual Matters.

In contrast to Pienemann, Towell and Hawkins firmly believe in the relevance of Chomsky's Principles and Parameters model to explain language acquisition. In this book, an interesting attempt is made to combine the ideas of the P&P model with processing mechanisms as proposed in the Levelt model.

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CONCLUDING SUMMARY

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CONCLUDING THOUGHTS: APPLIED LINGUISTICS AT THE JUNCTURE OF MILLENNIA

G. Richard Tucker

INTRODUCTION

As Peter Stearns, the noted social historian, observed in the preface to a recent monograph,

> However briefly and artificially, the turn of the century/ millennium will create a mirror in which we may be able to see where we've been coming from and where we are heading and wish to head. That's what the last turn of the century offered with complex and instructive results (1998:xi).

I am personally delighted to have an opportunity to contribute "Concluding Thoughts" to this volume, prepared as it is at the juncture of millennia, since it provides a similar opportunity for reflection and prediction, and since for one reason or another I have been an active participant in, and observer of, developments in the field of applied linguistics for more than three decades. Indeed my own career path reflects clearly the permeability of traditional departmental or disciplinary boundaries that has at once contributed to the sense of excitement and potential in the field and simultaneously to its lack of rootedness (e.g., I have at various times held academic appointments in departments of psychology, linguistics, and modern languages as well as worked for a private philanthropic foundation and a mission-oriented non-profit organization).

I would like to preface these "Concluding Thoughts" by observing that our field owes a debt of great gratitude to Charles A. Ferguson (1921–1998) who from my perspective long demonstrated an influential and far-reaching vision of what applied linguistics is and can be (see, for example, Ferguson 1998). This vision, developed and articulated on numerous occasions, was exemplified, for instance, by his inaugural plenary address at the very first AAAL meeting in Boston in December 1978, by his lecture "Applications of linguistics: Issues and challenges for the linguistic community" on the occasion of the golden anniversary of the Linguistic Society of America, and by his plenary address on the occasion of AAAL's 10th anniversary meeting in San Francisco. Ferguson also contributed to our evolving discipline more broadly by his service as founding director of the Center for Applied Linguistics (1959–1966). In this latter capacity, he was uniquely responsible for bringing to the attention of educators and policy makers throughout the world the contributions of applied linguists to problems of educational and national development. Exemplary of his accomplishments were his work in shaping the five-country East African Survey of Language Use and Language Teaching and his convening of the series of Anglo-American-French dialogues which became the exceedingly productive International Conferences on Second Language Problems (the so-called ICSLP conferences).

When one thinks of distinguished scholarship in our field, it is hard to imagine a more productive or a more respected scholar. In addition to his generally acknowledged reputation as the world's leading authority on Bengali, and some would add Arabic as well, Ferguson helped to define the parameters of the field of language policy and planning through his publications and his work as co-director of the International Research Project on Language Planning Processes. In addition, his early work on caretaker speech and on child phonology remain benchmarks for those who have attempted to follow in his footsteps. He was, as well, among the first to push the frontiers of the field by analyzing forms of speech such as sports announcers' talk, an innovative direction at the time, but one which would not now seem out of mainstream at all today. So in a very real sense the depth and the breadth of the field as we know it today owe much to the scholarship, the vision, and the leadership of Charles Ferguson It is fitting that he was the inaugural recipient of the AAAL Award for Distinguished Scholarship and Service and that he served us as a member of the Board of Editorial Directors of *ARAL*. I turn now to offer some integrative comments based upon the contributions to this volume.

OVERVIEW OF PROMINENT THEMES

Although each of the other 14 contributions to this volume stands alone and can profitably be consulted for specific and valuable information, the volume is also marked for me by the prominence of three themes: 1) a provocative and informative set of *reflections on disciplinary development(s)* (see, for example, Daoud, Kaplan and Grabe, Larsen-Freeman, Leki, Scovel, Takala and Sajavaara, Widdowson), 2) a clear articulation of a set of *major concerns*, and 3) a stimulating set of comments on likely *future directions* for the field (see, for example, Clapham, Crandall, de Bot, Kaplan and Grabe, Larsen-Freeman, Leki, Martin, Takala and Sajavaara, Widdowson). The second prominent theme above, the *major concerns* that were articulated, seem to me to be four in number: 1) a concern with the *social contexts* in which we conduct our research, develop our materials, teach our students, and contribute to policy formation (see, for example, Crandall, Larsen-Freeman, Leki, Martin, Swain, Takala and Sajavaara, Tarone);

2) an intersecting and overlapping concern with social *identity* and the ways in which an individual's multiple identities may affect factors such as language processing or the development of literacies (see, for example, de Bot, Larsen-Freeman, Leki); 3) a concern with *neglect*—whether it be the pervasive neglect of languages other than English (see, for example, Swales, Widdowson), neglect in the professional training of scholars from the so-called developing world (see, for example, Crandall, Daoud), or neglect for substantive areas such as sign language and signing that could benefit from our concentrated attention (e.g., de Bot); and 4) a concern with the need for adjusting or broadening the dominant *research paradigm* to include the collection of longitudinal data from multiple disciplinary perspectives (see, for example, Leki, Swain, Tarone). In the sections to follow, I will comment briefly on each of these three prominent themes.

1. Reflections on disciplinary development(s)

From my perspective, the tone for this theme, and for the complexity and importance of the underlying issues, is captured by authors' observations such as the following (excerpted verbatim in many of the observations to follow and often without direct attribution): With respect to applied linguistics *per se* we are told that the development of a disciplinary field is a messy undertaking, and that full disciplinary acceptance will occur only to the extent that applied linguistics responds to wider social needs and to the extent that its expertise is valued by people beyond the professional field. However, despite the ongoing discussions and debates to which Kaplan and Grabe and others refer, it seems clear that the trajectory and the momentum toward disciplinary recognition is positive. Given this development it is probably inevitable that discussion of the autonomy of sub-fields or specializations would follow, and thus it was instructive for me that a number of contributors wrote specifically about the emergence of their fields as autonomous sub-disciplines. Larsen-Freeman, for example, described developments in the field of SLA (Second Language Acquisition) and suggested the publication of Pit Corder's article (1967) as marking the point of demarcation for the two areas. Leki commented on the disintegration of links between those working within the areas of writing and literacy and those working within the domains of TESOL and applied linguistics while Swales, on the other hand, painted a very different picture for the "field" of LSP (Language for Special Purposes). He notes that the disjunction between ESP/LSP and language acquisition, basic FL methodology, psycholinguistics, and sociolinguistics has in the United States left little space in graduate programs for ESP work...and the lack of professional preparation has had deleterious effects on research and program quality...so that as a partial consequence ESP/LSP has yet to establish itself as either a full profession or as clear sub-discipline in the language sciences. In similar fashion, Takala and Sajavaara observed that systematic effort needs to be taken to develop professionalism in the area of LPLP (Language Policy and Language Planning) and that such professionalism could well involve emulation of the development of educational evaluation as a separate discipline leading ultimately to the autonomy of LPLP as a discipline. I was left with the distinct impression that the centrifugal forces at work will inevitably lead to continuing fragmentation of the field and enhance the likelihood posited by Martin that applied linguists could wind up as pidgin speakers of a range of theories, with theory so divorced from practice that any possibility of creolization is pretty much foreclosed.

2. A set of major concerns

As mentioned, I saw four cross-cutting concerns woven throughout the various contributions. These dealt with the importance of social context(s) and social identity, with issues of neglect, and with calls to broaden the prevalent research paradigms. Concern with the importance of attending to social context was ubiquitous. As Crandall noted in her review of teacher education, decontextualized theory fails to consider the multidimensionality and the unpredictability of the classroom environment. Takala and Sajavaara highlighted the centrality of context in their view of LPLP as a recursive cycle of CIPP (context, input, process, and product). Other contributors (e.g., Leki, Martin) spoke of literacy as social practice and of linguistics as social actions to be recontextualized in relation to new problems. Clearly the pendulum has swung over the past two decades as noted by Tarone and by Larsen-Freeman who observed that mainstream SLA is not (or at least is no longer) asocial and who described a growing body of research that demonstrates the importance of social factors in second language acquisition. For me personally, the most compelling invitation came from Martin who asserted that there is a plethora of critical discourse analysis which focuses on power and how it oppresses, but noted that what we are lacking is a complementary focus on how social subjects design change. If, Martin noted, we understood better the phenomenon of change in all of its multiple dimensions, then we could use this understanding to inform our social interventions—an observation that has profound implications for the training of future generations of applied linguists. In this regard, Swain provided a fascinating description of the ways in which a multifaceted program of research and evaluation of French Immersion programs—that was at once sensitive to and supportive of the complex social and political dynamics surrounding language education in Canada—has both led to educational change but may also atrophy as the experience become "normalized."

Several contributors voiced an intersecting and overlapping concern with social *identity* and the ways in which an individual's multiple identities may affect language processing or the development of literacies. De Bot, for example, speculated about the contributions of social psychological factors in language processing and wondered whether a speaker's *status* as minority or majority member affects the processes of perception and production. Larsen-Freeman reminded us that non-native speakers have multiple social identities that they bring to any situation and that being a language learner is only one of them, while Leki and others called our attention to the necessity to be aware of, and draw upon, the multiple home literacies that students in many of our classes bring with them and that will inform and either facilitate or inhibit the development of so-called academic literacy. Thus, those working within a sociocultural framework remind us that learners actively (co)construct their own learning and identity in adding another language to their repertoire and that we must be sensitive to such factors in our research, in our teaching, and in our theory building.

I found the concern with *neglect* to be the most poignant theme that underpinned many of the contributions. The multiple expressions of this theme were particularly distressing given the frequency with which they have been articulated in earlier editions of *ARAL*. So yet again, contributors remind us of the pervasive neglect of languages other than English. Swales decries, for example, the prospect of real loss of professional registers in many national cultures with long scholarly traditions; Larsen-Freeman calls attention to the paucity of research on the acquisition of non-European languages; Leki describes the absorption of writing researchers with English language contexts and with monolingual English-speaking countries. In a complementary vein, Daoud calls attention to our collective neglect in the professionalization or development of "local" researchers and scholars. He noted the conspicuous absence of host country nationals at the pioneering 1975 Hammemet Conference on Language for Specific Purposes and asserts, probably accurately, that the composition of the participants would likely not be very different today. Crandall, too, calls our attention to the need for extending socially, culturally, and pedagogically appropriate training programs to "non-native-speaking" teachers of language(s) who likely comprise numerically the most rapidly expanding pool of teacher candidates. Lastly, contributors expressed concerns for neglected *areas*—so, for example, de Bot devotes considerable attention to the area of sign language acquisition, processing, and use. In the aggregate, these areas of concern with *neglect* are profoundly depressing since they recur so regularly in our survey literature.

The fourth expressed concern in this category—that of broadening the dominant *research paradigm*—is quite different. This is more a call for ensuring that we provide graduate students with broad, as opposed to narrow, methodological training; that we encourage them to consider collecting, examining, and interpreting data from multiple perspectives; and that we stress the importance of collecting longitudinal data to provide a more comprehensive frame within which to examine conflicting claims (in this regard, see also, Tucker 1999a). Swain, for example, makes a cogent case for the necessity for "tracer" studies to examine the life choices pursued by the graduates of French Immersion programs, while Leki draws our attention to the value that can be added to our understanding by examining the acquisition of literacies over time.

3. Future directions for the field of applied linguistics

With respect to the third prominent theme, I will comment briefly on some of the thoughts expressed by contributors concerning future directions for our field. One consistent focus was a prediction of greater uses of technology in teaching and learning and the conduct of research (see, for example, de Bot on neuro-imaging; Clapham on assessment; and Kaplan and Grabe on implications for all aspects of our work as well as the remarks of Swales and Widdowson on the potential uses of corpus linguistics). Although I agree that we seem destined for presently inconceivable enhancements in this area, I have expressed concerns elsewhere (Tucker 1999b) as a result of my review of the extant educational literature and my continuing review of demographic trends and projections. These concerns combine to suggest that: 1) we must give concerted individual and collective attention to the problem of allocation and distribution of technological resources, and 2) we must implement as soon as is practical a multi-faceted and longitudinal research agenda to examine the value that is actually added for students who pursue some or all of their continuing education using innovative technologies.

In addition, there appeared to be broad agreement about the importance of collaboration in student learning, research, and research training (Kaplan and Grabe) and of ensuring that students are well versed in so-called paradigmatic as well as non-paradigmatic points of view (Larsen-Freeman). Nonetheless, Martin's caution that we not focus on training which features eclecticism stands in contrast to some of the other contributors and deserves our attention. Simultaneously, Crandall predicts the closer intersection of developments in teacher education with those in general teacher preparation while Clapham directs our attention to continuing developments in the areas of performance testing, alternative assessment, and a concern with ethical considerations in assessment and testing.

Clearly, the most striking cumulative impression for me was one of the vitality of the field. There are regular fora (e.g., the conferences of the *Association Internationale de Linguistique Appliquée*, and the American Association for Applied Linguistics) devoted to facilitating communication among researchers, practitioners, and policy makers; there are numerous journals, reviews, or series uniquely devoted to publication of work in the area; and there are many new monographs published annually on diverse aspects of this topic. Although I believe that the question of financial support for work in the broad domain of applied linguistics remains problematic, it seems inevitable to me that, at some point, policy makers and prospective funders will come to realize the centrality of language issues for educational and national development.

CONCLUDING OBSERVATION

By way of conclusion, let me note that the United States continues to receive over a million immigrants, legal and illegal, each year and that the foreign born is the fastest growing segment of the population. The most accurate prediction that we can make is that this trend will continue for the foreseeable future together with an increase in the number of native born individuals who will speak English as a second language. In addition, it is estimated that approximately one third of the population in urbanized western Europe under 35 years of age will have an immigrant background by the year 2000. These indicators suggest that the importance of language as a critical component of educational and national development in settings throughout the world will persist and likely grow more pervasive.

A recent study commissioned by the British Council on the future of the English language (Graddol 1997) underscores the growing need for all individuals to develop bilingual proficiency in order to be able to participate effectively in our increasingly global society. This situation poses challenges and opportunities for the applied linguist to craft a truly *applied* research agenda that can examine longitudinally, and from multiple perspectives, some of the perplexing questions that persist (NCLE 1998): What is the role of native language oral and literate proficiencies in the acquisition of a second or later studied language? What instructional sequences and approaches work best, and with whom? How can technology be effectively utilized? What is the relationship between teacher development on the one hand and program quality and learner attainment on the other? What immediate and long-term impact can be expected from various types of adult instructed-language programs? Which extant assessment instruments can reliably and validly document change in learner proficiency and at which levels?

Hopefully, during the decade ahead—with support from various public and private philanthropic sources—collaborative groups of researchers, educators, policy makers, and administrators will begin to ask questions such as these and gradually begin to aggregate relevant qualitative and quantitative data to shed light on the underlying issues. From my personal perspective, the search for answers to questions such as these should be accorded an exceptionally high priority since the *stakes* are so high. Consider information such as the following:

- Nearly one-sixth of the 5.9 billion people in the world cannot read or write according to a survey published by UNICEF (as reported in *The New York Times,* December 9, 1998);
- Three of four children in the "poorest nations" in the world are not in school (excerpted from the United Nations Human Development Report as reported in the *New York Times,* September 27, 1998);
- The additional cost of achieving and maintaining universal access to basic education for all, basic health care for all, reproductive health care for all women, adequate food for all, and clean water and safe sewers for all is roughly $40 billion a year—or less that 4 percent of the combined wealth of the 225 richest people in the world (*New York Times,* September 27, 1998);
- Providing universal primary education for all would cost about $8 billion per year (of the $40 billion mentioned above) which equals:

> About four days' worth of global military spending,
> Seven days' worth of currency speculation in international markets,
> The amount spent by Americans each year on cosmetics,
> Less than half of what Americans spend on toys for children each year,
> Less than the annual amount that Europeans spend on mineral water.
> (*Washington Post,* April 3, 1999)

I have long been struck by some remarks made by Courtney Cazden (Cazden, *et al.* 1990) in a report to UNICEF in which she noted: "...despite the centrality of language achievements in the developmental agenda of the [child], language issues are rarely in the forefront of thinking about how to plan environments for young children.... The prevalence of multilingualism in the world adds a particular urgency to the recommendation to attend [to the quality of language instruction available to the child] (p. 48)." Alas, these remarks are as relevant today as they were nine years ago.

I think it appropriate to end with what I find to be an apt quotation from Charles Ferguson (1998):

> In this autobiographical sketch I have made a point of the tension in my career between activist or 'applied' problem-solving on the one hand and 'pure' linguistic analysis and theory building on the other. While I recognize some validity to this dichotomy, I have never been able to agree with the extreme valorization of either at the expense of the other. It has always seemed to me that a theory that has little or no practical problem solving capacity is ipso facto less good than one that does and that one of the best places to look for clues to theory is in situations of 'application' (p. 54).

Like most of us, I eagerly await the further elaboration and development of our discipline in the millennium that is just beginning.

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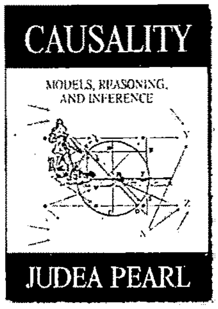

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Editor-in-Chief
Mary McGroarty

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This twenty-first volume of the *Annual Review of Applied Linguistics*, like the preceding volumes published beginning in 1981, is respectfully dedicated to the many professional applied linguists who were involved in helping to launch and sustain this publication; to those who have helped to formulate the framework for this and the previous volumes; to those who have contributed to the series; and to all applied linguists and their students who, it is hoped, will reap some benefit from its existence.

In addition, this volume is particularly dedicated to founding editor Robert B. Kaplan and his successor, William Grabe, in recognition of their work on behalf of the series and on behalf of the field of applied linguistics.

Annual Review of Applied Linguistics
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EDITOR'S INTRODUCTION

Mary McGroarty

Like Janus, this twenty-first volume of *ARAL* looks backward and forward at once. It is my first as editor. In assuming the task, I hope to continue the traditions of breadth of coverage, excellence and timeliness of contributions, and accuracy in bibliographical referencing set by my predecessors, Robert Kaplan and William Grabe. Their collective achievements have been considerable and fully merit the dedication of this volume to them.

Readers may well ask why select a theme of psychology and language, rather than, say, sociology, anthropology, or any other social science. Since the beginning of this century, psychology has played a distinctive role in North American academic life because of its simultaneous aspirations to build an intellectually coherent theoretical framework and solve practical problems. These two goals are sometimes compatible, sometimes not, but the resulting tensions reflect the dynamism of any field related to human behavior. Like psychology, applied linguistics, dealing as it does with issues of actual language learning and use, is dynamic and protean. The chapters here attest to some of the areas of commonality between the disciplines and some of the many gaps still to be filled and questions to be answered. With respect to content, the preface offers a fascinating glimpse into the recent history of the many connections between psychology and the study of language. Subsequent chapters address a variety of topics characteristic of all areas of learning (e.g., motivation, the biological basis of learning, individual differences); aspects of language experience related to bilingualism; and research methods.

In working with these chapters, I have been struck by the many areas in which psychology and applied linguistics may pose similar questions but answer them somewhat differently. It is crucial that applied linguists understand the related similarities and differences, and this volume provides a point of departure. Topics represented here are necessarily selective. While they represent many aspects of the relationships between psychology and the study of language, they are not exhaustive; issues related to the intersection of social psychology and applied linguistics, for example, are not treated. Such omissions reflect limitations of space, not judgments of potential applicability of various branches of psychological research to applied linguistics. Readers should take the selection of areas included in this volume as representative rather than definitive. As with all prior volumes of *ARAL*, the contents of each chapter represent solely the opinions of each contributor. Although all reasonable editorial efforts have been made to see that references are complete and accurate in all respects, presentation and interpretation of all sources presented reflect the sole perspective of the chapter authors.

Some procedural notes: with this volume, *ARAL* moves to use of the bibliographical format of the American Psychological Association, not only because it is close to this year's topic but because it is widely used by many journals in the field. For consistency and readability, some aspects of APA format have been slightly modified to harmonize with previous practices in the *ARAL* series. (There is, of course, no perfect bibliographic format; all are arbitrary to some extent, and represent efforts to facilitate locating important sources of information.) But the world of information retrieval now moves faster than many printed sources allow; there are as yet few guidelines for the use of, for example, on-line sources or websites. In working with the chapters here, I have endeavored to see that information on all sources is provided in such a way that readers can easily find the materials for themselves. In this respect, I hope that *ARAL* will continue to serve as an important research tool for all in the field, established scholars and novices alike. The three types of indexes provided—by author, by subject, and by contributor—follow the conventions established in previous volumes, where the Roman numeral indicates the volume number and the Arabic numeral the page on which an author is cited, a subject is mentioned or a contributor's chapter begins (e.g., Swain, M., XV/186 shows that Merrill Swain was cited on page 186 of Volume 15; interlanguage variation XIX/105-132 shows that variation in interlanguage was discussed on pages 105-132 of Volume 19).

It is a great privilege to assume the editorship of *ARAL*, and I am grateful to those who have assisted the efforts thus far: the Editorial Directors, whose suggestions have led directly to some of the chapters here, and the members of the Editorial Advisory Board, who have helped to identify potential contributors. I am particularly grateful to the contributors to Volume 21 for producing a set of current and provocative papers that will, I hope, further advance theory and research in the many domains where psychology and language overlap. The Cambridge University Press Journals staff members, Ed Barnas, Ed Carey, and Kevin Delgado, have offered timely responses and assistance in the planning and production of *ARAL*.

I am additionally indebted to those closer to the editing process for their constant assistance and willingness to answer questions. My immediate predecessor, Bill Grabe, has patiently provided a wealth of advice and sound direction when asked and refrained from doing so unless asked, surely a difficult line to walk when a new editor steps in. The *ARAL* Editorial Assistant, Beth Yule, has been a model of poise, professionalism, and promptness at each step in the process. Her many contributions to *ARAL* help to maintain the high quality of the series. Julie McCormick has, once again, used her technical mastery of page layout programs to take *ARAL* from a set of manuscripts into a book, and done so expeditiously and well. This year, the editing process was greatly facilitated by the computer expertise of Marc Lord, who established the electronic connections that allowed Beth, Julie, and me to coordinate our work efficiently. Erin Nielson provided useful assistance in bibliographical research. Able proofreading assistance was provided by Mary Johnson, Jeffrey Popko, and Heidi Vellenga, who each helped ensure a higher level of accuracy in the volume. I am also pleased to acknowledge the many varieties of in-kind support provided by the English Department and the College of Arts and Sciences at Northern Arizona University. This year, as in the past, they have provided the basic facilities and absorbed many incidental costs associated with production of the series.

Mary McGroarty
Flagstaff, Arizona
December, 2000

PREFACE: PEREGRINATIONS DOWN MEMORY LANE

Wilga M. Rivers

In 1960 I was looking for an interesting thesis topic. My advisor, Professor Harold Hand of the University of Illinois, suggested that I combine my two interests of language teaching and psychology and gave me a month to research the possibilities in this area. After a concentrated period of reading and searching, I gathered together my 3 by 5 cards and went to see Professor Hand. I reported to him that, from my reading, it was clear that, in the present state of the field, it would be impossible to apply the psychologists' theories to the processes of language learning and teaching. To this he replied "Then you go and do it."

I have always enjoyed responding to a challenge, so off I went to research anything I could find that might link psychological research to the learning and teaching of a second language. In 1960, behaviorist psychology, with its mechanistic emphasis on behavior as being acquired through the rewarding (reinforcement) of actions and the gradual building up of complex behavior through the combination of these simple elements, was still the dominant paradigm in most university departments. The basic process in operant conditioning, as it was called, was considered to be the stimulus-response or S-R unit. Skinner's William James Lectures on *Verbal Behavior*, given at Harvard in 1948, had finally been published in hardcover in 1957. In this book, Skinner maintained that learning a language was not essentially different from learning any other form of behavior; it was a matter of forming habits by conditioning through reinforcement, albeit most frequently secondary reinforcement. *Verbal Behavior* did not have the impact it might have had earlier, since the tide in psychological thinking was beginning to turn.

In psychology textbooks current at the time, it was rare to find discussions of personal characteristics such as emotional response or motivation. The chief "motives" in operant conditioning were hunger, thirst, and sex, as demonstrated in animal experiments. These seemed to have little application to the learner in the regular classroom, although some teachers did go to the lengths of giving out candy as rewards for correct responses. There had to be a better way, it seemed to me.

Throughout the 1950s, structuralism had held sway in the relatively few Linguistics Departments in the United States. In response to war needs in the forties, leading linguists had created the Army (later the audiolingual) Method of teaching languages. In the post-war years this approach had spread to the universities and schools, supported as it was by the National Defense Education Act (NDEA, 1958), which funded institutes for teaching teachers audiolingual tenets and practice. The method laid great emphasis on habit formation to a point of automatic response. It underplayed the expression of personal meaning in favor of learning structural patterns of the language. In this way it was compatible with the prevailing behaviorist paradigm, as well as the approach of structural linguists to the description of language. In vogue too was Shannon and Weaver's Information Theory (1949), with its mathematical underpinnings, the information processing of cognitive psychology only just appearing on the horizon. John Carroll's seminal book on the *Study of Language* (1953) had been a light in a gray dawn, as he endeavored, with a great deal of common sense, to bring linguistic theory to the attention of scholars in other fields.

From the point of view of psychology and classroom language teaching, the only book available at the time was by Huse (1931). This book was very dated and bore no relationship to the level of psychological knowledge in 1960. The promoters of the audiolingual method, however, asserted that their procedures were based on modern psychological theory. The interesting questions were: Were they? Was the psychological theory they espoused consonant with our increasing knowledge of language and language interiorization processes? They certainly emphasized the production of linguistic responses to stimuli by imitation and repetition in pattern drills and in memorized dialogues containing the common patterns of social discourse. They also emphasized habit formation through the secondary reinforcement provided by immediate knowledge of the correctness or incorrectness of the learner's response, in conformance with operant conditioning theory. They recommended that teachers should respond only to questions of *How*? (rarely *Why*?), since learning by analogy should replace cognitive analysis. Hence, in classroom practice, questions from students about the language were to be discouraged. Emphasis was put on rote memorization of spoken language, with as little recourse as possible to written material until the aural material had been absorbed and could be repeated. In this way theorists were relying short-term memory, without paying much attention to the way long-term memory processes operated.

All learners were expected to be able to learn in the same way; differences in learning preferences were completely ignored. After all, it was believed, human beings had learned their first language aurally and effortlessly by imitation and repetition of their mother's speech, so why should they not be able to learn a second language the same way? In 1960 scholars did not have access to the numerous longitudinal studies of first language acquisition that are now well established. Ruth Weir's pioneering research on *Language in the Crib*, which showed the amount of cognitive effort the child put into the first language, was not published until 1962. A plethora of studies from distinguished scholars like Bloom (1970), Braine (1971), Ervin-Tripp (1971), Slobin (1971a,b), Brown (1973), and their associates have since shown how individual and varied are the efforts of children in learning their first language, let alone their second.

There were, of course, voices to be heard dissenting from the classical behaviorist paradigm. In 1951, the neuropsychologist Lashley had published an influential article on "The problem of serial order in behavior" in which he made the case for many interacting systems in the brain and nervous system, rather than the simple, additive connections operant conditioning would predicate. His was something of a voice crying in the wilderness, but the minority who appreciated Lashley's work recognized it as pointing in an important new direction. The Gestalt psychologists of the forties were still respected in 1960, although theirs was not the current bandwagon. Their emphasis on the individual's organization of perception so that the whole has a significance different than the sum of its parts and is individually interpreted prefigured the later theories of cognitive psychologists. In Canada the neuropsychologist Hebb was setting forth original views about thinking processes in relation to the organization of the brain (1949) and influencing such future leaders as Wallace Lambert. Hebb was interested in perceptual organization, as well as the conceptual growth that comes with maturation. Piaget's work in Switzerland, with its analysis of age differences in thinking and perception, was just beginning to interest American scholars, his book with Inhelder on *the Growth of Logical Thinking from Childhood to Adolescence* having appeared in the U.S. only in 1958.

At the University of Illinois, Mowrer (1960a, b) had broken ranks with classical behaviorist psychologists by emphasizing the importance of the emotions of hope and fear in the study of human behavior. He maintained that habit was not a "fixed, automatic, unconscious neural connection or bond between some stimulus and some response" but that "most behavior [was] under voluntary control" (1960a; accompanying phonograph record). Osgood, to whom is attributed the invention of the term "psycholinguistics," had in the early 50s updated the S-R formula to include an intervening fractional meaning response that mediated between the observable S and R and produced distinctive and very individual self-stimulation, thus furnishing the unobservable stimulus for the response (1953, p. 697). In this formulation Osgood was putting the individual back in the study of behavior. Moreover, Osgood devoted more than one-third of his 1953 book on *Method and Theory in Experimental Psychology* to perception and symbolic processes like problem-solving, thinking, and language behavior, while Hilgard (1956), a standard text at the time, had given these subjects all of six pages of explicit discussion in a book of more than 500 pages.

Considering that a book published in the mid-1960s was probably being written several years earlier, it is interesting to compare two books brought out by the same publisher in the same series just a year apart: Hilgard and Bower's *Theories of Learning*, 3rd edition (1966), and Neisser's *Cognitive Psychology* (1967). Both books were influential and widely read. Both were interested in "how learning goes on," as Hilgard and Bower stated in their preface. Hilgard and Bower were shoring up and updating traditional learning theory from Thorndike's Connectionism to Freud's Psychodynamics, with a brief nod towards neurophysiology and the neuronal networks involved in awareness, arousal, and memory processes, all still considered within a stimulus-response paradigm. Neisser's book, however, was breaking ground for a new approach. In his preface, he states that the sequence of the book "follows stimulus information 'inward' from the organs of sense through many transformations and reconstructions, through to eventual use in memory and thought" (p. vii). He was interested in "*sensation, perception, imagery, retention, problem-solving, and thinking*" (his italics); for him "cognition is involved in everything a human being might possibly do," and consequently "every psychological phenomenon is a cognitive phenomenon" (p. 4). This is a far cry from theories based only on what is overtly observable and measurable.

Meanwhile, George Miller had been concentrating his attention on how people think and how they communicate. His *Language and Communication* (1951) was a beacon. "Original combinations of elements are the lifeblood of language," he maintained (p. 79). This book contained the delightfully written and influential article on "The magical number seven, plus or minus two" (pp. 14-44). Although still in the information theory mode, this article emphasized the importance of organizing and chunking in memory. I was delighted when Miller, Galanter, and Pribram's 1960 book, *Plans and the Structure of Behavior*, came out just as I was getting into deeper research for my dissertation topic. These researchers emphasized the way the individual processed information and transformed it into action through overall Plans, or strategy, that preceded and directed lower level Plans, or tactics (p. 16). This seemed to me very applicable to language use.

Chomsky and transformational-generative grammar were just coming on the scene in 1960. *Syntactic Structures* had been published in 1957; Chomsky's much quoted review of Skinner's *Verbal Behavior* appeared in *Language* in 1959. In this critique Chomsky stated categorically that "prediction of the behavior of a complex organism . . . would require, in addition to information about external stimulation, knowledge of the internal structure of the organism, the ways in which it processes input information, and organizes its own behavior." These characteristics, he further maintained, "are in general a complicated product of inborn structure, the genetically determined course of maturation, and past experience" (p. 27). This set out a diametrically opposed position to that of behaviorism. We were now beginning to hear about the Language Acquisition Device (LAD), and the bases were being laid for several decades of study of inborn language capacities. We were also hearing about systems of rules as basic to language production and the importance of hypothesis testing and learning from errors.

As Chomsky's generative grammar moved on through Government and Binding to Minimalist Syntax, this inborn language faculty based on Universal Grammar (UG) and hypothesis testing, resulting in parameter setting and resetting, remained basic and continued to influence much research in first and second language acquisition. In *Words and Things* (1958), Roger Brown had already drawn attention to the fact that children learn to produce new responses that they have not practiced specifically, but which conform to the system of the language they have interiorized. Brown's view undercut the prevailing notion that rote memorization of many useful sentences of the language in dialogues, and even as examples of patterns in drills, was sufficient to produce a communicating individual. His approach was compatible with Chomsky's assertion that language is generative, as shown by the fact that we are continually producing comprehensible sentences that we have never heard before (including this one!).

All use of language, Chomsky maintained, is creative (1966). George Miller later encapsulated this idea in his unforgettable way, stating that "it would take 100,000,000,000 centuries (one thousand times the age of the earth) to utter all the admissible twenty-word sentences of English" (1967, p. 80). So much for trying to memorize the sentences of target language! "Unless it is a cliché," Miller continued, "every sentence must come to us as a novel combination of morphemes." Fortunately, all this creativity is rule-governed, or we would not understand each other. As Chomsky reiterated in 1988, real creativity is free action, but always within a system of rules.

Cognitive psychology and psycholinguistics had now taken off, and we could learn from the work of Broadbent (1968) and Bever (1970), who centered their research on perception. Psychologists, however, found a marriage to the linguists in psycholinguistics to be a rocky road, in part because linguistics, being a young science, kept changing its theoretical bases, not only across schools of thought but within schools of thought as well. This led psychologists to declare their independence in clear terms. In his introduction to *Psycholinguistics* (1970), Roger Brown complained about the "rapid clip" at which linguistic theory changed, finding that this posed "real difficulties for the psychologist who wants to use linguistic theory in his own work" (p. ix). Slobin declared that it was not the work of psychologists to be "toolmaker to the linguist;" they had their own work to do (1971a, p. 24). Already Neisser had pointed out that the cognitive theorist could not "make assumptions casually" since they had to "conform to the results of 100 years of experimentation" (1967, pp. 4-5). Bever spoke for other cognitive psychologists when he expressed doubts about the existence of a specialized Language Acquisition Device, preferring to see as innate various cognitive structures which enable humans to acquire language as well as to perform other cognitive operations (1970, p. 352). This independent mindset was liberating in that it enabled psycholinguists to do work that would not become immediately obsolete because of linguistic changes over the weekend. Psycholinguists are able to supply data that help linguists to refine their theories, but they are also interested in developing theoretical ideas of their own that may help linguists to see whether their proposals are supported by facts of the real world.

In the 1970s, psycholinguistic research began to drift away from the dominant Chomskyan linguistic theory. Many psycholinguists found the theories of Fillmore (1968) in Case Grammar, G. Lakoff (1971) in Generative Semantics, Chafe (1970) in Relational Grammar, and Halliday (1973) in Functionalism more useful for their work; all of these theoretical positions were based more on semantics than syntax. Others like Schlesinger (1977) developed their own theories from their research. As the century moved into the 80s there was a flurry of publications setting forth the latest research on the brain. Psycholinguists became very interested in neuropsychology: how the brain perceives, organizes, stores, and interconnects information from its environment (both the inner environment of its own emotions and intentions and the outer environment of the physical context); how it changes and restructures this information; how it uses in performance what it has retrieved; and why at acts as it does, thus raising the question of motivation. (Schumann, in this volume, applies such information in his discussion of the amygdala as the seat of emotion and its effect on learning.) Coming from another direction, a cybernetic approach to cognitive processes led to the development of parallel distributed processing, or PDP (Hinton & Anderson, 1989). The possiblity of multiple parallel processing had already been proposed by Hebb (1949). Rivers (1990) discussed the application of PDP to language teaching.

In 1960, second language acquisition studies, as we now know them, were nowhere in sight. When I was appointed to the Department of Romance Languages and Literatures at Harvard in 1974, I was delighted to find a group of students at the Graduate School of Education studying with Courtney Cazden, a first language acquisition researcher (1968), and Catherine Snow, who had already carried out her well-known research with Hofnagel-Höhle (1978) on age differences in the learning of second languages. Cazden and Snow were mentoring students who were writing pioneer theses on second language acquisition. Those of us with this common interest gathered at brown bag lunches to discuss exciting new ideas arising from the students' research; among the group were John Schumann, Kenji Hakuta, Herlinda Cancino, Ellen Rosansky, and Ellen Rintell, with some participation from Marina Burt and Heidi Dulay who were already developing their Creative Construction theory (1974). Pit Corder, a pioneer in error analysis (1967) with whom Selinker had worked while elaborating his influential theory on interlanguage (1972), also visited us from Edinburgh and was most interested to know these discussions were proceeding. Roger Brown, also at Harvard, had published an important book on the acquisition of a first language in 1973; his ideas inspired others to examine second language acquisition at the same level of detail. One of Brown's insights was the natural order of acquisition of grammatical morphemes, which later generated many research projects. Hakuta collaborated with John (Haj) Ross at MIT on the first course in second language acquisition. It was a very exciting time to be in the profession.

Language theorists in the 1970s began to realize the importance of social psychology for their work, and sociolinguistics moved rapidly forward. Labov (1972) studied how language is actually used in different social contexts, and

Hymes defined "communicative competence" as "what a speaker needs to know to communicate effectively in culturally significant settings" (1968, p. vii). This work made a lot of sense to language researchers and language teachers, counterbalancing Chomsky's continual emphasis on linguistic competence as being essentially syntax-based. Throughout this period there was an undercurrent of interest in Vygotsky's ideas, developed before his death in 1934, on the social development of the individual's thinking processes and their relationship to speech and language (Vygotsky, 1986). His profound insights came to the surface from time to time as translations of his work became more readily available; more recently, they have come to command much greater attention (see Smagorinsky, this volume).

Interest was aroused in the dynamics of groups and the social roles and rituals in interaction, highlighted in Goffman's work (1967), and language teachers attempted to develop a learning environment where students might acquire communicative and pragmatic competence. Such attempts to develop ability to communicate with others in culturally acceptable ways led to a realization of the importance of understanding the subtleties of other cultures. From the beginning, the structural linguists had formed strong ties with the anthropologists, Sapir's work (1921) being very influential. The anthropologists had identified the patterned nature of other cultures. In my dissertation, published in 1964 as *The Psychologist and the Foreign Language Teacher*, I devoted a complete chapter to the complex question of understanding other cultures. Linking this question with psychology, I had written in some detail about Osgood, Suci, and Tannenbaum's *Semantic Differential* (1957), which attempted to separate out the evaluative factor in judgments of meaning from the cognitive or denotative (factual) element. This differential was tested extensively across diverse cultures with interesting results. Applied linguists found a wealth of material to draw on in sociocultural studies such as those of Hall (1959, 1966, 1976). We are now very much aware of the importance of learning to cope in a culture other than our own (Robinson, 1981).

In the 1990s there has been much research centered on the individual learner, notably the work of Oxford and her associates on learning strategies (1990). Gardner's *Multiple Intelligences* (1993) has also required those interested in the learning of languages by students of all ages and backgrounds to rethink their approach. Once we recognize that intelligence is not purely intellectual, but also verbal, mathematical-logical, spatial, kinesthetic, musical, interpersonal, and intrapersonal, we have much work to do to adapt our teaching to students with differing learning styles.

A glance at the articles in this volume of the *Annual Review of Applied Linguistics* shows how some topics of preoccupation have remained constant and how much some have changed over forty years. We continue to seek developments connecting psychology and linguistics (see Segalowitz, this volume); we continue to discuss the effect of syntactic structure on comprehension (Gass and Juffs chapters, this volume). We are now, however, also discussing much more personal, internal questions with regard to language learning. The individual learner is now solidly at the center of our research. We are now reconsidering language aptitude (Sparks and Ganschow), the importance of age in language learning (Singleton), and individual differences in learning styles; there is no longer a "one size fits all" mentality. Motivation (Dörnyei), language anxiety (Horwitz), and the role of emotion (Schumann) concern us, and we would like to know how and why what has been learned sometimes dissipates (Hansen). We are interested not only in the learning of first and second languages, but also in what takes place in the bilingual mind (Bialystok, Genesee). Reading research has made great strides and thrown much light on problems of literacy in first (Perfetti, Van Dyke, and Hart) and second (Geva and Wang) languages.

Why talk about these "old things"? I believe strongly that we should not forget our predecessors. Whether we are aware of it nor not, we are building on their foundations. Knowing where we have come from helps us to maintain perspective as we consider where we are going. It also helps us to avoid reinventing the wheel or repeating past mistakes. From our predecessors we can draw much data, as well as notions worth serious consideration in the light of new knowledge. Who does not value the work of that pioneer of longitudinal studies on the acquisition of two languages, Werner F. Leopold (1939-1949), who kept daily records of his daughter Hildegard's learning of English and German until she was seven?

Even Thorndike, who concentrated mainly on overt features of physical behavior, did not ignore the role of emotion and individual characteristics. In 1956, Hilgard referred to the motivational features Thorndike had outlined in 1913: interest in the work, interest in improvement, significance, problem-attitude, attentiveness, absence of irrelevant emotion, and absence of worry (p. 21). These factors sound quite contemporary. Each article in this book draws on the work of predecessors. Recently, when reading a funding application from a young colleague who proposed to establish a data bank on worthwhile work in teaching methodology, I was shocked to discover the references limited strictly to the last decade. Knowledge does not grow like this; fruit hangs long to mature, and even after maturity it is relished in preserved form. Old wine is appreciated even longer. Surely the work of our forebears is more valuable to us than old wine. Let us savor and rejoice in it.

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1. ON THE EVOLVING CONNECTIONS BETWEEN PSYCHOLOGY AND LINGUISTICS *

Norman Segalowitz

Over four decades ago the so-called Chomskyan revolution appeared to lay the foundation for a promising new partnership between linguistics and psychology. Many have now concluded, however, that the hopes originally expressed for this partnership were not realized. This chapter is about what went wrong and where we might go from here. The discussion first identifies three reasons why initial efforts at partnership may have been inherently flawed—divergent criteria for choosing among competing theories, different ideas about what was to be explained, and different approaches to questions about biology and environment. I then argue that recent developments—especially in associative learning theory, in cognitive neuroscience, and in linguistic theory—may provide a more solid basis for partnership. Next, the chapter describes two possible ways that bridges between the disciplines might develop. One draws on recent psychological research on attention focusing and on linguistic research concerning language constructions. The other draws on the concept of affordances and perspective taking. The chapter concludes that an enduring partnership between linguistics and psychology may indeed now be possible and that there may be a special role for applied linguistics in this new development.

The relationship between psychology and linguistics has been a curious one. Both aim to understand the fundamental nature of language so there ought to be a very close working association between them. Chomksy (1965, 2000) has even suggested, on more than one occasion, that the work of linguistics can be interpreted as part of psychology. Indeed, 40 years ago the relationship was close. Nevertheless, relatively speaking, psychological research on language today is far less driven by recent advances in theoretical linguistics than it was then; similarly, a great deal of work in theoretical linguistics makes little reference to current developments in psychology. The current state of affairs is easily confirmed by comparing works cited at the end of journal articles and textbooks in the two disciplines; apart from historical background references, one finds relatively little bibliographical overlap in a great number of writings. The sad truth is that many psychologists interested in language have not kept up with recent developments in linguistics, especially in what is referred to as the dominant paradigm (Universal Grammar) and, it would also seem that many linguists are not aware of what is happening in psychology, especially in cognitive psychology and cognitive neuropsychology.

The debate about the fundamental nature of language has involved mostly theoretical linguists and experimental psychologists. Applied linguists certainly have an interest in this debate, but they have typically addressed quite different issues from those of concern to theoretical linguists. Davies (1999), for example, lists the following research areas applied linguists engage in: how to provide better language instruction, diagnose speech pathologies, train translators and interpreters, compose valid language examinations, evaluate school bilingual programs, measure literacy, analyze the language of a text, advise on educational or forensic matters related to language. The opportunity for close relations between psychology and applied linguistics in each of these domains is great, and a volume could no doubt be written about each. The present review, however, focuses on what has become, for better or worse, the dominant question that has brought psychologists and linguists into discussion with each other—the question about the fundamental nature of language. As will be seen, there is emerging a new perspective that may be of special interest to applied linguists.

Why then, have the disciplines drifted apart? Can the answer suggest how a future collaboration might be more successful? Is a new partnership in the making? In this review, I identify some past barriers to cooperation between psychology and linguistics. I argue that these barriers appear to be dropping due to the rise of new research methodologies, and that we are now entering a time that may see a new convergence between the disciplines. Finally, I speculate about some possible directions that convergence could take, concluding that there may be an especially important role for applied linguists in this future collaboration.

The Past Four Decades

The Chomskyan revolution in linguistics of the late 1950s and 1960s stimulated a profound change in the way psychologists viewed language, making possible a new kind of collaboration with linguists (Lyons, 1991). This partnership was based on the belief that psychologists and linguists could now share a vision about the fundamental nature of language (Miller & Chomsky, 1963). Initial studies based on this new view were very encouraging, but ultimately the two disciplines drifted apart and the level of collaboration dropped significantly. A number of reasons for this drift have been discussed thoroughly elsewhere (e.g., Abrahamsen, 1987; McCauley, 1987; Reber, 1987; Sampson, 1997; Tomasello, 1998). However, three points in particular are worth considering here because, with hindsight, they might suggest why the partnership was bound to fail and they may point to a better way to build a bridge in the future.

Divergent Theory Building Criteria

In the 1960s, many psychologists treated the new insights from linguistics as a description of the grammar posited to underlie language competence. It was natural, therefore, to ask whether this linguistic grammar might serve as a specific theory of the brain's mental grammar. The story of how psychologists attempted to test this idea is interesting, but too long and complex to relate here; the important point is that after some early successes, most psychologists failed to be convinced that the then current theories of linguistic grammar could usefully serve as a theory of the brain's grammar (Reber, 1987; Tomasello, 1998). Psychological theory and linguistic theory appeared to be incompatible at some important level and psychologists and linguists, by and large, gave up looking for ways to reconcile their differences.

Why? Among the reasons for this failure is the following. Within their respective disciplines, linguists and psychologists necessarily have to choose from time to time between contending theoretical explanations for the phenomena they investigate. The choice is usually made, ideally, by deciding which contending theory best provides an account that generalizes over all relevant data in the domain while, at the same time, remaining as economical as possible in terms of theoretical elegance and simplicity. These decision guidelines serve as economy criteria for theory building and are intended to ensure that newly accepted theories do a better job than the ones they displace. The problem in the past was that linguists and psychologists generally differed regarding what the relevant data should be when applying these economy criteria. Psychologists tended to prefer theories that explained facts about language processing and development, while linguists generally favored theories that accounted for sentence relatedness as reflected in native speakers' intuitions. Initially, when the set of linguistic phenomena to account for was relatively small, psychological and linguistic theories about language could appear, without much difficulty, to be compatible with each other. Over time, however, more and more data about language intuitions and language processing were gathered. Theory building in the two disciplines inevitably moved in divergent directions, reflecting the fact that the theory builders, in trying to account for very different kinds of data, were using different economy criteria (Watt, 1970).

Divergent Approaches to Explanation

A related reason for the disciplines drifting apart has been their differing approaches to explanation. The dominant paradigm of linguistics, as it emerged during the revolution in linguistic theory in the late 1950s, asserted that there exists an innately determined, autonomously functioning Universal Grammar (UG), a "language faculty" or "organ of mind" (Chomsky, 1975; Lightfoot, 1999; Pinker, 1994). The goal of UG linguistics has been to provide a full characterization of this organ. The language faculty is distinguished from general cognitive systems insofar as it specifies, for all human languages, the way patterns underlying language are related to each other and to surface forms of the language. This organ of mind is said to predispose us to process linguistic information in ways that are highly specific to the language domain and unrelated to general cognitive processing. By consulting native speaker intuitions, it has been claimed that we can make inferences about the nature of this organ of mind.

In contrast, the dominant approach in psychology generally has been to focus on the cognitive and neurocognitive *processes* that underlie adaptation. Questions about language, then, are questions about how the human brain solves problems of communication, and the answers must take into account the variegated structure of the brain and its considerable, though not unlimited, plasticity (Bates, 1994). During the past four decades, many psychologists were able to accept, in principle at least, the UG inspired idea that there might be a highly specialized, cognitive module dedicated to language. After all, examples of brain specialization abound. Acceptance of this idea no doubt was further facilitated by the popular computer metaphor of the mind central to much of cognitive psychology. Nevertheless, there emerged a serious explanatory gap between psychologists and linguists on this issue. Psychologists generally were unsure how one could study the language faculty in relation to brain function, given that the faculty was characterized chiefly in terms of abstract, mathematical formalizations not mappable in any direct way onto observable behavior or brain systems.

Linguists objected that it was inappropriate to search for such simple, direct correspondences between the abstract characteristics of language and observable behavior and brain activity. In terms of Marr's (1982) distinctions regarding explanation, UG is a Level 1 theory, a computational theory of *what* is to be explained, not how language is implemented. The point of contention for many linguists and psychologists is whether the computational level of explanation is the only level that is appropriate and, if not, then how to link that level to explanations of the mechanism that are psychologically satisfying (see Black, 1970; Chomsky, 1970a; 1970b; Jackendoff, 1999). Ultimately, the issue appears to reduce to how separate or modular (Fodor, 1983) one believes language is in relation to other forms of cognition; if language is not separate, then the computational approach is not so compelling and may even be inappropriate (Marr, 1982, p. 356).

Recently, it should be noted, there has been an upsurge of interest in some new sources of data that may speak to the issue of a language faculty. This is research on individuals for whom there is a large discrepancy between their language and other cognitive abilities, or who have language disabilities that appear to be inherited (e.g., Gopnick & Crago, 1991; Smith & Tsimpli, 1995; Van der Lely, 1997). Some have interpreted these cases as support for the language faculty hypothesis (Newmeyer, 1997; Pinker, 1994); however, the topic remains controversial (see, for example, especially Bates, 1994; Bates, in press; and Leonard, 1998, for discussion). Regardless of where one stands with respect to these particular studies, the fact is that debate over the status of the constructs "language faculty" and "organ of mind" has not moved closer to a mutually accepted resolution in several decades, and this has served to weaken enthusiasm for the partnership.

Divergent Approaches to Biology and Environment

A third factor in the drift apart has been a difference between the *way* most psychologists and most UG linguists approach the question about how biology and environment contribute to language. UG linguists have generally been unimpressed with psychologists' attempts to turn to learning-based explanations for language acquisition, citing the lack of sensitivity in their models to the deeper complexities of language structure. To many psychologists, however, it has often appeared that UG linguistics made recourse to what Dawkins (1986) called, in a different context, "the argument from personal incredulity." This is the argument that, because one personally cannot see how a phenomenon can be explained within one framework, the only available alternative must therefore probably be true, even in the absence of specific evidence for it. The child's acquisition of a first language is a case in point here. UG linguists point out that all children master their first language despite the very complex and—from the child's point of view—arbitrary structure underlying it, and this acquisition is surprisingly rapid and occurs in an environment that provides few supportive instructional clues (Chomsky, 1965; Jackendoff, 1994; Lightfoot, 1999). Here we have the problem of the "poverty of the stimulus" or Plato's Problem. How is it that the child comes to know so much about language without support of the environment? To explain this early mastery, it was argued (and still is, for example, in Lightfoot 1999; but see Newmeyer, 1998, for a more nuanced position) that there *must* exist an innately determined, brain-based, language-specific organ of mind that somehow predisposes the child appropriately. The choice of this innateness solution to the problem of language acquisition is generally defended on the grounds that it is inconceivable that any plausible solution will ever be found solely within a general learning theory framework.

The UG linguists' proposal that there exists a language organ dissociated from general cognition was received by psychologists with some interest at first. However, over time discussion became increasingly polarized, and this may be due in some measure to the *way* the case for an innate language faculty was made. UG advocates were perceived as dismissing learning frameworks virtually out of hand, claiming that they could never, in principle, provide a satisfactory account of language, even though no testable proposal was offered for the biological alternative (in part, no doubt, because psychological tests were not thought to be appropriate). The result was an impasse with no understanding among researchers in either discipline of what kind of evidence, even in principle, could persuade researchers in the other discipline and thereby help advance the discussion.

Psychologists and linguists, by and large, went their separate ways. Psychologists focused on learning questions and UG linguists concentrated on developing fuller and more refined mathematical formalizations of the underlying properties of language structure. Almost no one pursued a neurocognitive search for the basis of innate universal language structures.

With hindsight, it might be concluded that these three contrasting ways of addressing questions about language—divergent criteria for choosing among competing theories, different ideas about what is to be explained, and dissimilar ways of addressing questions about biology and environment—probably doomed the partnership from the beginning. On a more optimistic note, perhaps we can now draw lessons about what is needed if interdisciplinary collaboration is to be successful in the future. Of course, one cannot legislate change. The differences just recounted were part and parcel of the two research cultures that existed at the time. Ultimately, we will see if new generations of researchers shift their views to make convergence possible. I think we are now witnessing such a shift in the making, for the reasons described in the next section.

Seeds of Convergence?

Recent developments suggest we may soon see a new era of collaboration between linguistics and psychology that, one hopes, will be more enduring. Three examples are noted here and the final one will be elaborated with respect to some possible avenues for convergence in the future.

Modeling Associative Learning

Until recently, many people thought that a simple associative learning system could not, even in principle, acquire behavior that had the rule-governed look of the language used by very young children. It was widely believed that learning systems consisting only of simple associative mechanisms could never abstract linguistic categories without some built-in (or "innate") predisposition to do so. However, the emergence of powerful new techniques for modeling associative learning, such as connectionist networks (Bechtel & Abrahamsen, 1991; Elman, Bates, Johnson, Karmiloff-Smith, Parisi, & Plunkett, 1996; Rumelhart & McClelland, 1987) and latent semantic analysis (Landauer & Dumais, 1997) are challenging these beliefs. Bechtel (1996), for example, has shown that, at least in principle, it is possible to train a connectionist network to acquire knowledge of abstract categories that underlie rule-governed behavior without building into the network prior knowledge of the rules or the categories. Rumelhart and McClelland (1987) demonstrated that a connectionist network can learn to correctly inflect regular and irregular verbs for the past tense and to generalize this behavior to new exemplars. All that the associative network contains at the start of learning is the ability to make and modify associations between its internal elements as a function of error correction feedback.

Not everyone has concluded that such research succeeds in demonstrating that associative learning alone can account for the origins of rule-governed language abilities and this provides a solution to Plato's problem (Bechtel, 1996, p. 74-75; Pinker & Prince, 1988). Nevertheless, one can see a noteworthy shift in the debate. Connectionist models and latent semantic analysis can now be viewed, at a minimum, as existence proofs demonstrating the existence of associative learning systems with the following interesting properties: they can acquire rule-like behavior without prior knowledge of the rules, without having to "compute" the rule in the course of learning and without having a predisposition for working with rules built into them. The question, then, about "what knowledge must be in the head" for language to be learned (Bechtel, 1996) has now become an empirical question, whereas before it was one chiefly of speculation. The matter can now be decided by more modeling and experiments that match the output of ever more sophisticated associative models to data about what people do when they use language. That there has been a basic shift in the tone of debate can be seen by comparing, for example, linguists Wexler and Culicover (1980) with Pinker (1999), all supporters of the language faculty construct. In their book, Wexler and Culicover dismissed associative approaches to language learning in a line or two and then concluded "In particular, no theory of acquisition can explain the acquisition of the rich and intricate system of syntax" (1980, p. 2). Pinker (1999), on the other hand, discusses the data offered by connectionists on their own terms. Thus, although far from being resolved, questions about the "poverty of the stimulus" and "Plato's Problem" now appear amenable to research, given the powerful new modeling techniques developed in recent years.

Advances in the Neurosciences

Advances in recent decades in the neurosciences and in neurolinguistics have changed our appreciation of how language is implemented in the brain, compared to how matters were understood forty or more years ago. Our grasp of modularity, brain plasticity, domain specificity—topics central to many of the concerns of linguists and psychologists—has changed dramatically in the last four decades, chiefly because of the emergence of powerful new brain imaging techniques and the increased collaborative work of neuropsychologists and cognitive psychologists (Rugg, 1999). Questions about the brain that were stimulated by UG linguistics—questions about a possible organ of mind, about the language faculty, about innate knowledge—are undergoing reformulation in light of what is now known about the brain. In many respects, these advances may have rendered some of the previous theoretical differences irrelevant because the nature of the questions has changed (Bates, 1994, in press-b). For excellent reviews of the numerous developments in this field, see Brown and Hagoort (1999b), Gazzaniga (2000), Grodzinsky, Shapiro, and Swinney (2000), and Stemmer and Whitaker (1998).

Two points merit comment here. First, complex functional systems such as attention and memory that in the past were referred to as "faculties" have been fractionated into components that are subserved by different areas of the brain. For example, Posner and his colleagues (e.g., Posner & Petersen, 1990) and others have identified anatomically distinct subsystems that carry out different functions of attention such as orienting to sensory events, detecting signals for conscious processing, maintaining a vigilant or alert state, exerting top-down executive control, and disengaging focus of attention. It is now clear that while regions of the brain carry out highly specialized activities, there is at the same time no single "module" for attention or consciousness; what we call attention is a complex activity of the whole brain carried out by a highly integrated (in a healthy brain) network of subsystems. The same is true for language. Language functions are not subserved by just one or two regions in the left hemisphere, as may once have been thought, but by a highly integrated network of subsystems widely distributed across the brain (Brown & Hagoort, 1999a). This has obvious implications for the idea of a language "module" or unitary language faculty subserving language acquisition.

The second point deserving mention is the finding that while, in most people, analogous regions of the brain tend to serve the same language functions (for example, grammatical functions tend to be carried out in frontal regions and anterior temporal regions of the left hemisphere, while semantic functions involving content or "open class" words tend to be carried out in the posterior cortex), the exact anatomical location of the functions can vary considerably from individual to individual. Moreover, these two subsystems have different sensitive periods for development; if normal development is altered, say by the early onset of deafness, then different brain regions may become responsible for some functions (Neville, Mills, & Lawson, 1992). Such findings point to the considerable plasticity of the brain, a fact which again requires re-evaluation of earlier ideas originating in both psychology and linguistics about how the brain may be specialized for language.

New Developments in Linguistics

Within linguistics itself, there have emerged new approaches challenging the central tenets of UG, approaches known variously as cognitive grammar, functional linguistics, and cognitive linguistics (e.g., Fauconnier, 1994; Givón 1995; Goldberg, 1995; Lakoff, 1987; Langacker 1987, 1991). These approaches challenge the need for many aspects of the formalist UG paradigm, in particular the constructs "autonomous syntax," "language faculty," and "organ of mind." At the moment, there seems to be relatively little dialog between UG linguists and cognitive linguists, but a welcome and important exception is Newmeyer (1998). These new approaches, which I will refer to collectively as "cognitive linguistics," are beginning to have a special appeal to psychologists (Ellis, 1999; Tomasello, 1998; Ungerer & Schmid, 1996).

This development within linguistics has the potential for rebuilding a close partnership with psychology for the following main reason: proponents of cognitive linguistics have declared as their chief goal providing a *psychologically* plausible account of language. For example, Langacker (1998) writes that the movement called *cognitive linguistics*

> contrasts with formalist approaches by viewing language as an integral facet of cognition (not a separate "module" or "mental faculty"). Insofar as is possible, linguistic structure is analyzed in terms of more basic systems and abilities (e.g., perception, attention, categorization) from which it cannot be dissociated. (1998, p. 1).

Tomasello (1998) refers to these developments in linguistics as a "New Psychology of Language." Of course, a simple declaration of intent does not guarantee success. In fact, I will argue below that more steps must be taken if the psychological content of cognitive linguistics is to be satisfactorily linked to psychology. Nevertheless, the "cognitive" in the new cognitive linguistics has the potential of providing a basis for collaboration.

Speculations on a Future Psychology-Linguistics Partnership

How might a bridge be built between psychology and this "New Psychology of Language"? By way of illustration, two examples intended to serve as starting points for thinking about new ways of developing a partnership are considered here. The first comes from a recent study on second language (L2) fluency and attention in our laboratory (Segalowitz & Frenkiel, in preparation) and provides an illustration of how research addressing linguistic constructions as cognitive schemata might converge with the broader psychological study of cognitive schemata. The second example builds on the psychological concept of affordances and the "perspective taking" approach described by MacWhinney (1999).

Attention Focusing and Linguistic Constructions

Language fluency can refer to many different things, including the extent of one's vocabulary, control over grammar, eloquence in the language, ability to write, speed of comprehension, ability to speak without hesitation, accuracy of understanding, skill in public speaking, ease of using the language in various situations, ability to translate, among others (Riggenbach, 2000; Schmidt, 1992). If we focus just on those aspects of fluency that reflect speed and ease of language processing, then fluency is not a topic one normally thinks about in terms of linguistic theory. In the way we have been accustomed to dividing up chores between psychology and linguistics, research on fluency (here, speed and ease of processing) should be about the operation of performance constraints and individual differences, and not about the underlying, fundamental nature of language itself. In this section, however, we will consider how studying such aspects of fluency might provide a way to address some questions about the basic nature of language.

Now, one of the tenets of cognitive linguistics is that linguistic constructions are cognitive schemata or, as Fauconnier (1994) puts it, devices that prompt the construction of schemata. A schema is the brain's representation of the understanding of an event a person thinks about or hears described in language; we might think of it, metaphorically, as a kind of map or diagram in the mind. Cognitive linguists work from the premise that linguistically prompted schemata are no different from the kind used in nonlinguistic behaviors (e.g., Langacker, 1987). Linguistic constructions reflect the way component elements are related to each other in a speaker's schema or mental representation of the thought being expressed. These constructions can be used to direct another person's attention while his or her own schema is progressively elaborated in the course of communication. For example, a speaker may use adverbial constructions to signal when something occurred ("before"), or use conjunctions to signal the logical connection between two events ("because"). Linguistic constructions are used to foreground and background certain elements within a schema (Langacker, 1987, 1991) and to place elements in proper relation to one another. In other words, the speaker or writer elicits a mental representation in the brain of the listener or reader by using available language packaging devices to affect schema building processes. In this view, a fluent L2 user will be one who can rapidly shift focus of attention from one dimension of schema building to another as a function of the linguistic constructions encountered during communication.

The ability to shift attention rapidly and flexibly is an important aspect of cognitive control. In our research, we have been interested in measuring individual differences in cognitive control as it relates to L2 skill development (Segalowitz, 2000). In the study to be summarized here, we asked whether a person's L2 fluency level, defined in our work as efficient language processing, is related to the ability to shift focus of attention in response to commonly used time words and logical connectives. We used time words which place events represented in a mental model of the world either closer to or further away from the present moment (*now, next, promptly, shortly;* or *afterward, later, tomorrow, never*). We also used causal connection words that link ideas in a mental model by indicating the presence or absence of a causal connection (*because, consequently, due to, therefore; although, but, despite, however*). Thus, for example, if someone says "I'll do it **now**" versus "I'll do it **later**," a fluent listener will construct a mental model or schema of what the speaker intends, and locate the part of that schema corresponding to the action somewhere on a time line. The word *now* places the action very close to the present moment on this time line, and *later* places it further away. Similarly, if someone says "John did well in his exams **because** he studied all night" versus "John did well in his exams **despite** partying all night," the listener will construct schemata that foreground the elements differently. *Because* indicates that the second idea (that he studied all night) is to be foregrounded as the cause of John doing well, whereas *despite* signals that the second idea (that he partied all night) is *not* the cause of John doing well.

We investigated the relationship between L2 fluency (speed of single word reading) and the linguistic control of attention focusing in English speaking university students with varying levels of ability in French. In the main part of the experiment, they had to perform an attention switching task based on a procedure developed by Rogers and Monsell (1995). In this task, they had to judge words presented one at a time. When a time word was shown, they pressed the left or right button to indicate if the word referred to a time near or far from the present moment. When a causal connection word was shown, they pressed to indicate whether the word referred to a cause being present or absent. The design of the study was such that every alternate trial required a switch from a time judgement to a causal connection judgement, and trials in between required a repeat (i.e., the sequence was ... *time time cause cause time time* ...). As others have found using this switching paradigm in a variety of situations, the reaction time (RT) on switch trials was systematically slower than RT on repeat trials. The difference in these RTs provided an index of the cost of switching, namely of how much more difficult it was to respond when one had to change the focus of attention from one dimension to the other. This task was conducted in both French and English, in separate blocks. We also calculated an index of English and French reading fluency based on RTs in a task in which participants judged whether words referred to living or nonliving objects using variability of word recognition RT as described in Segalowitz and Segalowitz (1993).

The two most important results are these: First, the French (L2) switch cost was found to correlate quite highly with the measure of French fluency ($r = .652$, $p = .006$). This suggested that, as hypothesized, the ability to switch attention focus in L2 is related to fluency. It is important to note that this measure of French switch cost involved a difference score between RT on repeat and switch trials and so was not confounded with individual differences in single word reading fluency (or even the speed of button pressing), as was the fluency measure. The second result was that French switch cost was still significantly related to French L2 fluency even after English reading fluency was statistically partialled out ($r = .648$, $p = .007$). This is especially interesting because it indicates that the relationship between attention focusing ability and L2 fluency in French was not due solely to a *general* cognitive ability to focus attention that would be operating in both language situations. Rather, the results indicated that L2 fluency was significantly related to a measure of cognitive control specific to reading in the L2, the kind of control that may be involved when updating a schema as a function of linguistic input.

This technique provides a way of assessing how easily a person can switch from one dimension of linguistically signaled attention to another. We are currently experimenting with this and related paradigms to assess linguistically controlled attention in a longitudinal study of adult second language learners. Research of this type has interesting potential for building new bridges between psychology and linguistics (of the cognitive linguistics variety). One can ask, for example, whether some modes of linguistically directed attention are acquired earlier than others. If so, is this a function of the linguistic construction itself (e.g., how complex the construction is) or of the type of attention control involved (e.g., control in a time dimension versus a spatial or some other dimension)? How do these attention directing skills unfold and what role do they play in L1 and L2 development? What kinds of language and non-linguistic experience are required to achieve a given level of ability in linguistically directed attention? The program of research implied by these questions will involve language analyses of the type done by cognitive linguists, combined with field observation of people using and acquiring language in real situations, plus laboratory investigation of the behavioral and the brain correlates that underlie skilled use of cognitive schemata under the control of linguistic constructions.

On the psychological side, the techniques for such research now exist. On the linguistic side, too, a great deal of knowledge has already been accumulated about the acquisition of different linguistic constructions, especially in cross-linguistic language acquisition research (Slobin, 1985–1997, 1997). In this respect, Slobin (1996) has put forward an interesting hypothesis that could be explored through the kind of psychology/linguistics partnership envisaged above. Slobin hypothesized that the most challenging aspects of a second language are those elements that refer to categories of meaning that "cannot be experienced directly in our perceptual, sensorimotor, and practical dealings with the world." Examples include the aspectual difference in meaning between "She *went* to work" versus "She *has gone* to work," or the definiteness difference between "*a* car" and "*the* car," distinctions not all languages signal explicitly (Slobin, 1996, p. 91). These constructions serve to place certain elements or aspects of a situation into the foreground of attention, while placing others into the background. In a much fuller treatment of this topic, Talmy (1996) discusses what he calls the "windowing of attention" by language, also from a cognitive linguistic perspective (see also Tomlin, 1997). The volume *Language and Space* (Bloom, Peterson, Nadel & Garrett 1996) contains a number of papers that also address the way language constructions map onto cognitive (spatial) schemata.

Affordances

The dominant view in much of psychology is that linguistic communication is about the packaging of *propositions* in a way that allows the receiver to unpack the information as intended by the sender. MacWhinney (1999) discusses an interesting alternative to this view by arguing instead that language is used to communicate *perspectives*, rather than propositions. He identifies four levels of perspective taking, one of which is especially germane to the present discussion—*affordances*.

The concept of *affordances* was introduced into the psychology of perception by Gibson (1977). He proposed that what an organism perceives is the set of possibilities the environment provides—or affords—for fulfilling its goals. Gibson defined affordances as follows: The affordance of an object to an animal or an individual is "a specific combination of the properties of its substance and its surfaces taken *with reference to the animal*" (1977, p. 67, emphasis added). That is, information about these affordances is encoded in terms that refer to the self, rather than in the neutral terms of primary sensations (color, form, texture, etc.) describable without reference to the organism or its place in the environment. Support for this approach to perception has been accumulating in recent years from investigations demonstrating that people's perceptions of the physical environment (doorways, stairs, catchable objects) are encoded in terms that relate to their own body measurements and capacities (Lee, 1993; Mark, 1987; Van den Bergh, Vrana & Eelen, 1990; Warren, 1984; Warren & Whang, 1987). (For fuller discussions, including some of the more controversial issues involved, see Carlson, 1997; Greeno, 1994; Kelso, 1995; Marr, 1982). Affordances, in this view, are important for learning, because it is only by being able to perceive affordances that an organism is able to navigate its way around the environment successfully. Learning, according to Gibson (1966), involves not remembering past events, but becoming attuned to—that is, able to attend to—invariant information provided by the environment (e.g., perceiving that a given object affords support even though its color, shape, and other characteristics may vary as lighting conditions change, etc.; see also Bransford, McCarrell, Franks & Nitsch 1977).

Now, MacWhinney (1999) draws attention to the important role language plays in communicating information about situational affordances, and how this fact about language fits in well with some current research trends in psychology concerning the role of action and embodiment in learning and memory (e.g., Glenberg, 1997). He suggests that this approach to the relationship between language and memory may provide new insights into the process of language acquisition and will help us understand how language emerges from experience. While this idea is very promising, and should be pursued, I think there is another, unexpected yet potentially fruitful, avenue to explore if we take MacWhinney's point about affordances and language just one step further. This avenue may even lead to an unanticipated opportunity for collaboration between psychologists and linguists.

It is this: We can consider a language itself, like any physical environment, as possessing affordances. A given language supports a particular set of constructions, as described by cognitive linguists (e.g., Goldberg, 1995; Langacker, 1987, 1991), which are available for packaging a message if the speaker knows how to use them. These constructions afford the possibility of making certain messages but not others, and make some messages easier to communicate than others. There is also, of course, variation across languages in the availability and nature of many of these linguistic affordances. Following upon Gibson, we can hypothesize that *language acquisition involves attuning one's attention system to perceive the communicative affordances provided by the linguistic environment*. Now, a psychologist might ask: Is the perception of affordances really a critical element in learning in general? Important contributions to the answer may possibly come from future collaborative research involving psychologists and linguists. This work will require the study of language use and acquisition in a variety of settings in order to observe the distribution of linguistic affordances and determine whether and how learners make use of them in the acquisition process. Linguists are uniquely equipped to inform psychologists about the affordances in such environments. Finally, it is probable that *applied* linguists, because of their involvement in observing language acquisition and language use in a wide variety of contexts, will have an especially important contribution to make here.

Summary and Conclusion

We have seen that, despite initial efforts more than four decades ago, theoretical linguists and cognitive psychologists have not succeeded in developing a unified view of language that is broadly accepted by researchers in the two disciplines. The reasons discussed here include divergent approaches regarding how a theory about language should develop, what kind of explanation is appropriate, and how to address basic questions about biology and environment. There are signs, however, that future prospects for collaboration are brighter. Specifically, new advances in the brain sciences and in modeling associative learning systems have refocused many older questions and put debate on a firmer empirical basis. At the very least, there now appears to be emerging a consensus on what kinds of evidence will decide issues regarding the poverty of the stimulus, the rule-governed nature of language, the modularity of language systems in the brain, etc., even if there is not yet broad agreement about the actual substance of the issues themselves. This emerging consensus about what counts as evidence is probably the most important change that has occurred. It is what makes possible a new bridge to be built between the disciplines. An especially exciting development is the emergence of new approaches from within linguistics that explicitly try to link models of language to cognitive psychological processes. This chapter has presented two examples of how such approaches might develop into collaborative research programs. Applied linguists, in particular, might have a special contribution to make in this new collaboration.

Notes

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Barlow, M., & Kemmer, S. (Eds.) (2000). *Usage based models of language.* Stanford, CA: Center for the Study of Language and Information.

This volume contains a collection of papers exploring various questions about language, all from the vantage point of usage-based models of language, where theory about a person's linguistic system is grounded in instances of producing and understanding language. Ronald Langacker, who coined the term "usage based model," provides a very useful chapter outlining the cognitive psychological and the linguistic assumptions underlying this idea. The volume contains chapters on phonology, on some of the premises of neurolinguistic approaches to language, and on connectionist models of usage based models of language. The chapters point to areas where collaboration between psychologists and linguists may be fruitful.

Savage-Rumbaugh, S., Shanker, S., & Taylor, T. (1998). *Apes, language and the human mind.* Oxford: Oxford University Press.

This volume reports some impressive language-like performance by nonhuman primates and discusses these achievements in terms of what it teaches us about human capacity for language. These authors challenge both Tomasello's view that humans have a unique ability to regard others as intentional beings and that this accounts for the emergence of language, and Chomsky's view that, at bottom, language acquisition involves a species specific innate module for language development. The volume will be stimulating for both linguists and psychologists.

Talmy, L. (2000). *Toward a cognitive semantics.* Volumes I & II. Cambridge, MA: MIT Press.

These two volumes represent an updated collection of Talmy's most important contributions to the development of cognitive linguistics. Of special interest to psychologists are his ideas about how language structure shapes attention. These volumes provide an excellent and detailed example of the "new psychology of language" referred to by Tomasello (1998), discussed earlier.

Tomasello, M. (1999). *The cultural origins of human cognition.* Cambridge, MA: Harvard University Press.

Tomasello, following Langacker (1987), approaches language development from the premise that "language is...cognition packaged for purposes of interpersonal communication" (p. 150). In his view, what makes humans special is their ability to perceive others as intentional agents, which makes possible participation in joint attentional scenes, interactions where child and adult jointly attend to some event or object, and to each other's communicative intentions. Language is the means by which people direct the attention of other persons in such interactions, in order to make them adopt a certain perspective on some event or object. Drawing upon insights from cognitive linguistics, Tomasello develops this hypothesis, arguing that interesting structural properties of language flow from the existence of joint attention scenes in development, rather than from innate, language specific mechanisms.

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2. APPRAISAL PSYCHOLOGY, NEUROBIOLOGY, AND LANGUAGE

John H. Schumann

This volume of *The Annual Review of Applied Linguistics* explores the connections between psychology and language. In the following chapter, I will show how a field that increasingly informs psychology can also inform the psychological issues that concern applied linguists. Neurobiology and psychology have become more closely integrated in recent years as evidenced by the emergence and development of such disciplinary interfaces as biopsychology and cognitive neuroscience. The recognition that psychological phenomena are subserved by the brain is widely accepted; via developments in neuroimaging technology, the brain is becoming amenable to direct psychological investigation. In this chapter, I examine brain mechanisms that are involved in second language acquisition motivation, in cognitive/motor exploratory activity in learning, and in decision-making aspects of pragmatics in language use.

The Neurobiological Circuitry

There is a neural system in the brain that appears to subserve two important functions — stimulus appraisal and social cognition. Stimulus appraisal involves the assessment of the emotional and motivational relevance of agents, events, and objects encountered by an individual in its environment (Leventhal & Scherer, 1987; Ortony, Clore, & Collins, 1988; Scherer, 1999). Such appraisals generate tendencies to undertake mental and motor activity in relation to given stimuli (Frijda, 1987). Social cognition is the ability to make hypotheses about the intentions and dispositions of others (Brothers, 1990) and to reason about personal and social issues (Damasio, 1994).

In this chapter, I propose that the confluence of stimulus appraisal and social cognition that is effected by this neural system has important implications for language and learning theories. I describe the anatomy and functions of this neural system, and then I propose to show how it may operate in motivation for SLA (Schumann, 1997) and how—in , conjunction with some additional circuits—it may operate in generating mental and motor activity for learning generally (Schumann, in press-a, in press-b). Finally, I will argue that the major components of this system also subserve decision-making in language pragmatics (Schumann, 1990).

The mechanism involved in this neural system consists of the amygdala (located in the temporal lobes) and the orbitofrontal cortex (located in the front of the brain above the orbits of the eyes). These areas connect to systems in the body proper—i.e., the autonomic nervous system (responsible for fight or flight responses), the endocrine system (responsible for the regulation of hormones), and the musculoskeletal system (responsible for body position, tension, and movement) (Damasio, 1994; Schumann, 1997).

The Amygdala

The amygdala is an almond-shaped nuclear structure located in the anterior part of each temporal lobe. Much research on the amygdala has shown that it responds to negative stimuli, particularly to stimuli that are threatening or frightening. For example, monkeys who have had their amygdalas removed lose their natural fear of snakes (Klüver & Bucy, 1939). Similarly, rats are usually wary of new objects in their environment, but when their amygdalas have been ablated, this neophobia is vastly diminished (Rolls, 1995). Likewise, rats can be conditioned to fear a tone because it will be followed by a foot shock. If their amygdalas are destroyed, they will not form an association between the tone and the shock, and their fear conditioning will be impaired (LeDoux, 1996).

In humans, the destruction of both amygdalas is rare, but several cases are currently being studied. One such patient has been shown to have deficits in recognizing fear and "blended" emotion in other peoples' faces (Adolphs, Tranel, Damasio, & Damasio, 1994). Another patient demonstrates impairment in matching pictures that depict emotions with the names of those emotions and in matching pairs of photographs that depict the same emotion. In addition, this patient has difficulty determining when and if someone is looking at her (Young, et al., 1995).

Moreover, patients exhibiting amygdala damage have been shown to judge as trustworthy and approachable pictures of faces of people whom normal subjects appraise as untrustworthy and unapproachable. When judging pictures of people whose faces are generally deemed approachable and trustworthy by normal subjects, however, the amygdala-damaged patients do make similar judgments (Adolphs, Tranel, & Damasio, 1998). Patients with bilateral amygdala damage have also been shown to have a positive bias in evaluating pictures (line drawings, landscapes, spheres, and Mondrians) which normals evaluated negatively (Adolphs & Tranel, 1999).

In another experiment, normal controls and a subject with amygdala damage were shown a video in which three geometric shapes moved on a screen. When asked what they had observed, the normal subjects interpreted the action of the figures in social terms, imbuing them with goals and desires, etc. The subject with amygdala damage provided a strictly geometric description of the action, without attributing mental states to the figures (Heberlein et al., 1998, cited in Adolphs, 1999). An amygdala-damaged patient was also shown to be able to recognize valence (pleasantness or unpleasantness) in facial expressions and in descriptions of various situations, but was impaired in comparison to controls in rating the arousal level (energy, wakefulness) of a person with a particular facial expression or of a person described as having a particular experience. This patient gave low arousal ratings for emotions with negative valence, and, in comparison to controls, provided low ratings for stimuli representing fear and anger (Adolphs, Russell, & Tranel, 1999).

Normal subjects in a Stroop test[1] showed more amygdala activity as measured by positron emission tomography (PET) when naming the color of threat words (e.g. *persecute, assassinate, failure, blame*) than when naming the color of neutral words (e.g. *review, custom, bowl, pen, journey*) (Isenberg et al., 1999). In comparison to normal controls, a subject with bilateral amygdala damage had difficulty identifying emotions (*happy, angry, sad*) in sentences that were read to her. This patient was also impaired in deciding whether pairs of sentences were read by the same or different people and performed at chance level in deciding whether a sentence read to her was a statement, a question, or an exclamation. On a task in which words were read with intonation indicating a particular emotion, the patient had great difficulty identifying fear; she also had problems distinguishing happy and sad intonations. Finally, when asked to identify the emotions in nonverbal sounds (grunts, growls, etc.), she performed poorly in identifying fear and anger (Scott et al., 1997).

In a recent experiment, non-amygdala damaged subjects showed higher regional cerebral blood flow (rCBF) in the amygdalas and hippocampal areas for the observation of both pleasant and aversive stimuli than for interesting but emotionally neutral stimuli. When the same subjects were tested four weeks later, they had higher recognition memory for the emotionally pleasant and aversive pictures than for the emotionally neutral stimuli (Hamann, Ely, Grafton, & Kilts, 1999). Researchers (McGaugh, Roozendaal, & Cahill, 2000) report that the interaction of various neuromodulators (such as epinephrine, glucocorticoids, opoid peptides, and GABA, an inhibitory neurotransmitter) in the amygdala (basolateral area) enhances the formation of long-term declarative memory elsewhere in the brain for both positive and aversive emotional events. Citing Cahill et al. (1996), they report a PET study which showed a correlation between subjects' glucose metabolic rate while watching emotional videos and while recalling the incidents in these videos when tested three weeks later.

Finally, Adolphs (1999), citing Bradley, Pety, and Lang (1992) and Mealy, Daood, and Krage (1996), describes research which shows that emotionally and socially relevant stimuli are remembered better by normals than they are by patients with bilateral amygdala damage (Adolphs, Cahill, Schul, & Babinsky, 1997).

The amygdala research reviewed above indicates that this set of nuclei in the brain is involved in the appraisal of the emotional relevance of pleasant and aversive stimuli, visual and auditory stimuli, social stimuli (such as faces, voices, and arousal levels), nonsocial stimuli (geometric shapes, pictures), and the content and prosody of verbal stimuli. Furthermore, the amygdala appears to be particularly sensitive to stimuli that represent fear or threat. Finally, the amygdala seems to be involved in the formation of long-term memories of emotional stimuli.

The Orbitofrontal Cortex (OFC)

The orbitofrontal cortex (or ventromedial prefrontal cortex) is located in the front of the brain, above the orbits of the eyes. This region of the brain appears to be involved in the acquisition of knowledge about social conventions as well as in the control of behavior related to those conventions. In addition, the OFC appears to subserve reasoning about social, moral, and personal issues. In this latter role, it helps to bias an individual's decision-making toward a subset of alternatives in reasoning about complex social, moral, or personal situations, through its connections to the peripheral nervous system (the autonomic nervous system, the endocrine system, and the musculoskeletal system) (Anderson, Bechara, Damasio, Tranel, & Damasio, 1999; Bechara, Damasio, & Damasio, 2000; Damasio, 1994).

The OFC also seems to be involved in learning and in tracking reward contingencies. It provides signals when a behavior ceases to be rewarding (Rolls, 2000) and thus prevents perseveration in unproductive and in counterproductive activities. Rolls (2000) also reports research indicating that the OFC is involved in recognizing and identifying the emotional qualities of others' facial and vocal expressions and that different parts of the OFC are selectively responsive to pleasant touch, pain, taste, and smell.

People with OFC damage have been shown to ignore social conventions and to become rude, vulgar, and disrespectful. They appear unconcerned about their behaviors, even when those behaviors are harmful to themselves or others. They are unaffected or unresponsive to the consequences of their actions and thus are unembarrassed and unashamed by social, professional, and personal failures. They are frequently unable to keep goals in mind, they become distracted by local environmental stimuli, and they are inclined to continue activities even after those activities cease to be rewarding or productive (Adolphs, 1999; Bechara et al., 2000; Damasio, 1994). Yet, although adults with OFC damage have impaired social, personal, and emotional reasoning and behavior, they frequently have access to the declarative knowledge underpinning it. However, patients who incur OFC damage in early childhood seem to be unable to acquire the knowledge necessary for appropriate social and moral reasoning and decision-making (Anderson, et al., 1999). In addition, recent research (Denburg, 1999, cited in Bechara et al., 2000) indicates that some adults over 64 years of age perform on tests of personal decision making (see the gambling task below) in ways similar to OFC patients. This may indicate that, in some adults, the OFC may be subject to acquired impairments with increasing age.

An experiment involving a gambling task has been successful in demonstrating orbitofrontal deficits. In this experiment, subjects are asked to choose from four decks of cards, two of which generate high winnings and even higher losses. The other two decks produce smaller winnings and smaller losses which, in the long run, generate a larger amount of money. Normal subjects relatively quickly switch from the risky decks to the decks that generate smaller losses. OFC patients continue to select from the high-risk decks in spite of the repeated losses. Some of these patients even become consciously aware of the inevitable loss associated with the risky decks, but continue to choose from them, nevertheless. In addition, normal subjects develop anticipatory skin conductance responses (low levels of perspiration) that appear before choosing from a risky deck. The OFC patients, however, get no such signals from their autonomic nervous systems when they consider a high risk choice (Bechara et al., 2000). Thus, the OFC appears to be involved in the acquisition of information about social and personal behavior and in the ability to guide an individual in the regulation of that behavior.

The Body Proper

As mentioned earlier, the amygdala and the OFC have reciprocal connections to areas of the peripheral nervous system (which consists of the autonomic nervous system, the endocrine system, and the musculoskeletal system). Damasio (1994) proposes that the perception of stimuli generates a bodily state in the peripheral nervous system. The bodily state (called a *somatic marker*, from the Greek word *soma*, meaning "body") is considered an emotion that is communicated back to the brain as a feeling. This feeling arises as a result of the juxtaposition of the ongoing perception of the current stimulus situation with stored images of the same or similar situations that have been encountered in the past. Such association is called a *dispositional representation*. The feeling is essentially an appraisal of the emotional and motivational relevance of the stimulus. This appraisal, in turn, provides information about whether a given stimulus is positive or negative, good or bad, and about whether it should be engaged or avoided. When stimulus situations have been frequently associated in the past with their emotional valence (as indicated by the presence of a somatic marker), they can become represented in the brain itself and no longer need processing in the peripheral nervous system.

From Stimulus Appraisal to Motivation

Although Damasio and his colleagues emphasize the role of the neural system discussed above (and, in particular, the OFC) in social reasoning and decision making, I would like to suggest that, at its most basic level, the mechanisms of this system subserve the individual's appraisal of the emotional valence and motivational relevance of stimuli. The process of stimulus appraisal has been studied by psychologists interested in emotion. These researchers believe that the perception of a stimulus or stimulus situation itself does not generate an emotion; rather, the construal by the individual of how the stimulus will affect him or her is what produces an emotional state (Leventhal & Scherer, 1997; Scherer, 1999). Appraisal psychologists have conducted extensive research to determine the criteria on which the assessments of stimulus situations are made, and Scherer (1988, 1999) finds that there is remarkable consistency across the dimensions proposed by the various researchers. The categories described below (by Scherer, 1984, and Leventhal & Scherer, 1987) provide a system that adequately reflects, at the psychological level, the workings of the biological mechanisms described above (see also Schumann, 1997).

Scherer (1984) identifies five appraisal dimensions—i.e., novelty, pleasantness, goal or need significance, coping ability, and compatibility with self and social image. Novelty appraisal assesses whether a given stimulus is the same as previously encountered stimuli or whether it is new. Pleasantness appraisal is concerned with whether or not the experiencer finds a stimulus appealing, enjoyable, or pleasant in and of itself. Coping ability (or *coping potential*) is an appraisal by the individual of his or her ability to deal effectively with the physical, mental, and social demands of a stimulus or stimulus situation. Finally, self and social compatibility appraisal evaluates a stimulus with respect to the experiencer's view of his or her ideal self and with respect to the experiencer's perceived views of family, friends, and community.

Such stimulus appraisals generate tendencies to undertake mental and motor activity in relation to a stimulus. These tendencies may involve approach behavior, withdrawal or avoidance behaviors, or neutral behavior that maintains the organism's current relationship *vis à vis* the stimulus (Frijda, 1987; Frijda, Knipers, & ter Schure, 1989; Schumann, 1997).

Schumann (1997) notes that the questions used in motivation questionnaires in second language acquisition research actually elicit appraisals of objects, events, and agents related to the target language. On the basis of this observation, he argues that "motivation" may actually be *patterns of stimulus appraisal*. For example, Gardner (1985) uses the following questions, all of which evoke appraisals, in his Attitude and Motivation Test Battery:

"French Canadians add a distinctive flavor to Canadian culture" (Gardner, 1985, p. 178). This question assesses the appealingness, or *pleasantness*, of agents.

"Studying French can be important to me because it will allow me to meet and converse with more varied people" (Gardner, 1985, p. 179). This probe assesses *goal compatibility.*

"Studying French can be important for me because other people will respect me more if I have a knowledge of a foreign language" (Gardner, 1985, p. 179). This question elicits appraisals on the dimensions of *goal relevance* and *norm/self compatibility.*

"I get nervous and confused when I am speaking in my French class" (Gardner, 1985, p. 179). This probe generates appraisal on several dimensions: *coping potential, norm/self compatibility,* and *appealingness.*

Schumann (1997, in press) suggests that, as a system, the amygdala and orbitofrontal cortex, interacting with incoming signals from the body proper, may subserve stimulus appraisal in humans. In this system, the amygdala may operate in the appraisal of the basic pleasantness of stimuli and would certainly be involved in the assessment of threat and arousal and in determinations relating these stimuli to coping potential. Moreover, evidence from animal research (Rolls, 1995) indicates that the amygdala is sensitive to novelty. Amygdala-damaged patients' difficulties with determining whether people are trustworthy and approachable would also affect their coping potential appraisals (Adolphs et al., 1998). The fact that amygdala patients positively evaluate pictures that normals appraise negatively also seems to indicate that the amygdala is involved in stimulus appraisal on the dimension of pleasantness.

Damasio (1994) and Schumann (1997) argue that the orbitofrontal cortex (OFC) subserves appraisals established during the lifetime of the individual through education, socialization, and experience. This contention is supported by the evidence that OFC patients who incur brain damage very early in life have diminished ability to acquire social rules, and that adults with OFC damage have deficits in implementing such rules, despite having acquired the prerequisite knowledge. Such difficulties certainly impact these patients' stimulus appraisals made on the basis of self and social compatibility and appropriateness. Their problems in personal and social decision-making, as evidenced in the gambling experiments, indicate that the OFC participates in appraisals of *coping potential.* The fact the OFC patients have difficulty keeping goals in mind and perseverate in unrewarding behaviors indicates that the OFC is involved in appraisals of *goal relevance.* Finally, the fact that various areas of the OFC are sensitive to touch, taste, and smell (Rolls, 1999) suggests that it is just as intricately involved in appraisals of *pleasantness* and perhaps *novelty.*

From Appraisal to Behavior: Translating Motivation into Action

Learning requires a goal—i.e., the desire to possess some knowledge or skill. This goal functions as a reward, and achieving it is perceived by the organism as pleasurable, reinforcing, or rewarding. It would appear that such goals are generated by positive appraisals of particular outcomes; in the case of learning, a positive appraisal by an individual of his or her having some particular knowledge or skill. This appraisal would be the equivalent of liking the idea of knowing something or the idea of being able to do something (Berridge & Robinson, 1998). But in order to achieve such goals, liking has to become wanting (*ibid.*), and activity has to be generated to reach the goal.

A potential *incentive motive* (or goal) functions as an environmental stimulus that is appraised positively and thus as something to be desired. Such a goal has to be maintained and translated into mental and/or motor activity for its achievement. The neural substrate supporting goal generation and maintenance (See Figure 1) appears to be a circuit consisting of the amygdala and the orbitofrontal cortex and includes dopaminergic innervation of two additional structures, the nucleus accumbens shell and the ventromedial ventral pallidum (Depue & Collins, 1999; Deutch, Bourdelais & Zahm, 1993; Heimer, Alheid & Zahm, 1993; Kalivas, Churchill, & Klietnick, 1993; Mogensen, Brudzynski, Wu, & Yim, 1993; Schumann, 1997, in press- a; in press- b). The translation of the incentive motive, or goal, into behavior to achieve the goal is subserved by a circuit (See Figure 1) consisting of projections from the ventromedial ventral pallidum to the mediodorsal thalamus to the prefrontal cortex (area 32), back to the nucleus accumbens core to the dorsolateral ventral pallidum and then to the pedunculopontine nucleus, the brain stem motor nuclei, and the spinal cord (Deutch et al., 1993, Heimer et al., 1993; Kalivas et al., 1993; Mogensen et al., 1993; Schumann, 2001, in press; Skinner & Garcia-Rill, 1993).

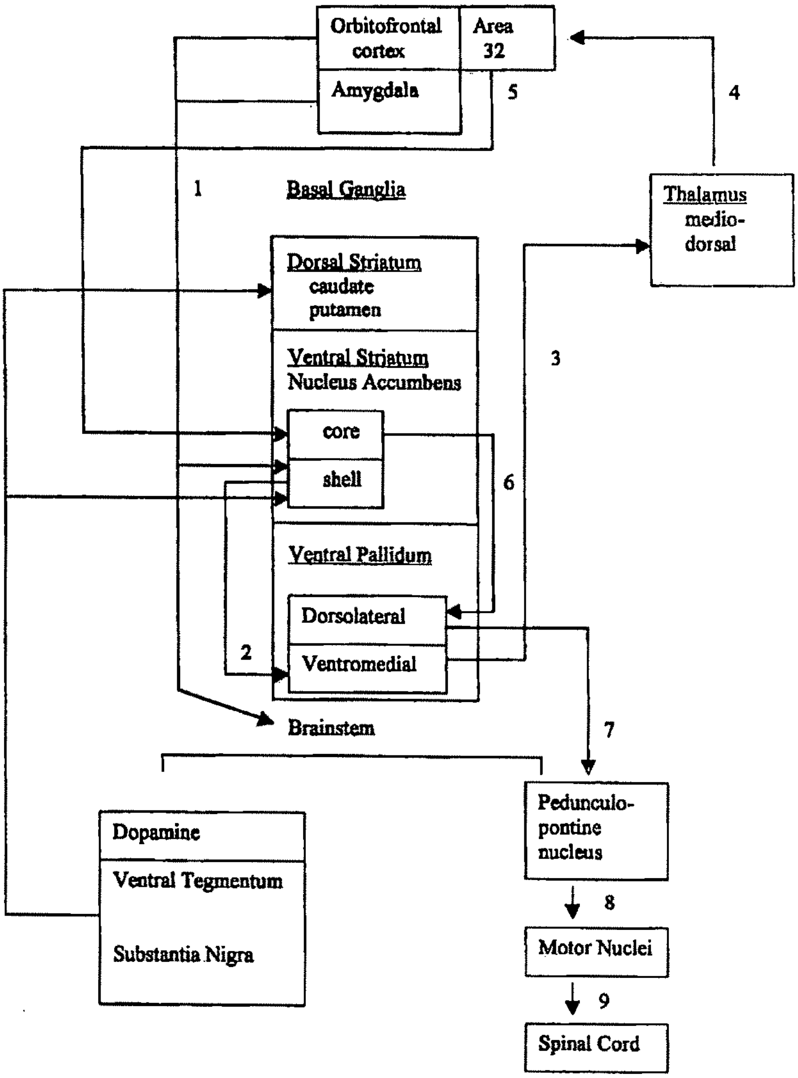

Figure 1: Mechanisms for stimulus appraisal, incentive motive/goal formation, and the translation of an incentive motive/goal into motor and mental behavior.

Schultz, Tremblay, and Hollerman (2000) have examined the responses of neurons in the orbitofrontal cortex, the dorsal and ventral striatum (i.e., the caudate, putamen, and nucleus accumbens), and in midbrain dopaminergic regions (the ventral tegmentum and the substantia nigra) that are responsive to stimuli related to reward processing. Each of these areas contains neurons that respond to reward, and that do so simultaneously; however, neurons in each area function in somewhat different ways.

The researchers discovered that monkey orbitofrontal neurons were activated by instructions that were predictive of reward (food or juice). These neurons were also active for a period just before the reward was supplied, and they spiked again after the monkey had consumed the reward. Orbitofrontal neurons were also sensitive to reward preferences, generating more activity for the preferred reward. Neurons in the striatum (STR) were activated when the animals received instructions that had been associated with reward. Some STR neurons also showed a long and gradually increasing activation between the instruction and a trigger. STR neurons also showed activation prior to or in expectation of reward (related to motor activity for getting the reward) and after consumption of the reward. Dopamine (DA) neurons were driven initially by unexpected reward and then by antecedent stimuli predicting the reward. These neurons also showed excitation during the perception of stimuli that elicit attention. Finally, when a predicted reward did not materialize, dopamine activity became depressed. Thus, in this system, neurons respond in expectation of reward during a period just before a predictable reward is delivered (OFC, STR), during musculoskeletal activity undertaken in expectation and preparation for reward (STR), to stimuli that predict reward (DA, some OFC, some STR), after rewards that are predictable and expected (OFC, STR), and after unpredicted rewards (OFC, DA). In addition, dopamine neurons show depressed activity when an anticipated reward fails to appear.

Berridge and Robinson (1998) report that rats exhibiting nearly 100 percent depletion of dopamine retain the ability to ascertain the pleasurable qualities of food stimuli, but that they lose the ability to make the necessary efforts to obtain and to consume such food. On the basis of this evidence, the researchers argue that dopamine is involved in "wanting," but that it is not necessary for "liking." They suggest that dopamine allows the organism to attribute *incentive salience* to environmental stimuli such that certain agents, events, or objects associated with previous reward (conditioned stimuli) become desirable and worthy of effort and engagement in their own right because of the expectation that they will lead to future reward. Stimuli that accrue such incentive salience are attractive and elicit approach—i.e., exploratory behavior that can ultimately lead to reward or to the achievement of a goal. If, in future encounters, such stimuli generate a positive hedonic state (i.e., "liking"), then the incentive value will remain and will continue to elicit instrumental or appetitive behavior. If, however, future engagement with the stimuli do not produce a positive state, the stimuli (agents, events, and objects) will lose their incentive value.

Ikemoto and Panksepp (1999) argue that nucleus accumbens dopamine produces a "flexible approach response system" (p. 26). Rats and humans have some behaviors that are fixed habits; these fixed action patterns are either inherited or developed. In the face of certain stimuli, such habits have a strong tendency to produce fixed responses. The nucleus accumbens dopamine system, however, enables more flexible investigatory activity, potentially allowing stimuli to accrue incentive qualities signaling reward (e.g., achieving one's goal). Such signals are essentially "go" signals (Rolls, 1999), indicating to the organism that it should continue its activity—i.e., continue mental and/or motor approach behaviors leading to food consumption or goal achievement.

Like Berridge et al. (1998), Ikemoto et al. (1999) note that the action of dopamine on the nucleus accumbens does not simply provide pleasure or euphoria in the way that sex or food consumption might. Rather, destruction of the nucleus accumbens does not decrease consummatory behaviors, but instead decreases exploratory activity antecedent to consumption. Ikemoto et al. suggest that the conscious experience of dopamine transmission in the nucleus accumbens might be described at the symbolic level as "curiosity" or "interest" or "urge"—with the last phenomenological manifestation occurring just before consummation.

From this perspective, in a particular environment, nucleus accumbens dopamine can be seen as guiding the learner to respond in an adaptive way to environmental agents, actions, and objects that constitute incentive stimuli associated with reward. Ikemoto et al. (1999) argue that the nucleus accumbens dopamine system guides such appropriate behaviors until they become familiar and routine, at which point the behavior is off-loaded onto the striatal (caudate and putamen) habit system. Here it can be initiated and implemented automatically in the presence of the incentive stimuli, which are recognized by declarative memory. If, however, new stimuli are introduced within this context—or if the individual moves into a new environment—the nucleus accumbens dopamine system must again be engaged to facilitate recognition and acquisition of the incentive properties of the new stimuli.

Because familiar stimuli are less likely to generate nucleus accumbens dopamine transmission (Ikemoto et al., 1999), the dopamine mechanism fosters investigatory behaviors toward novel stimuli. These behaviors allow appraisal of the incentive value of novel stimuli; such appraisals, in turn, lead to either approach activity or to activity that will allow the organism to withdraw to safety.

Thus, ablation of the nucleus accumbens will disrupt reward (goal) seeking behaviors, but once the behaviors become routine (i.e., habits), lesioning the ventral striatum will not affect learned behaviors (Ikemoto et al., 1999). This generalization is further supported by research (ibid.) which shows that self-administration of alcohol by rats can be diminished by ablating the ventral striatum during the learning phase, but that once such behaviors become habit, destruction of the nucleus accumbens does not affect the rats' reward seeking activities.

Several researchers have suggested that the ventral striatal dopaminergic system is a major component of the neural system that subserves foraging in animals and humans (Ikemoto et al., 1999; Montaque, Dayan, Pearson & Sejnowski, 1995; Robbins & Everitt, 1996). On the basis of this research, as well as much of the work reported in the current paper, Schumann (2001, in press) has suggested that learning may be a form of foraging, and that the motor and mental activity involved in foraging for knowledge and skill may be subserved largely by the same mechanisms as those underpinning foraging for food.

For example, a learner who has the goal of acquiring a second language must translate the incentive motive into motor and mental activity in order to engage with sources of target language input. In other words, the learner must discover incentive stimuli that will help him or her learn the language. Such incentive stimuli might be a class, a teacher, a language teaching method, approach or technique, a text, particular explanations, vocabulary, exercises, tests and other assessment instruments or procedures, fellow learners, target language speakers, the target language culture and, of course, tokens of the spoken and written language itself. All these stimuli are associated with the reward or the goal—i.e., the acquisition of the second language. When the learner encounters them, they are appraised for their *novelty, goal relevance, coping challenges,* and their *compatibility with the learner's self and social image.*

If the learner perceives the incentive stimuli to be rewarding (i.e., if they facilitate her perception that she is acquiring the target language), we can hypothesize that her amygdala and orbitofrontal cortex are subserving those appraisals and that dopamine innervation of the striatum is also supporting the assessments (as well as the mental and physical activity that the learner expends in engaging those stimuli). In other words, the learner will be *motivated.* Contrarily, if certain stimuli related to the acquisition of the target language are *not* perceived as facilitating the goal/reward, the relevant negative appraisals will be made, dopamine activity will be suppressed, and the stimuli will be avoided. In this case, the learner will lose motivation and become *demotivated.* If such stimulus appraisals are sufficiently negative over a period of time, the learner may abandon her goal altogether.

Another example of learning as foraging can be seen in scholarly activity. A researcher may forage on a computer and locate references to several articles which he thinks might be relevant to a goal—e.g., developing a model or a theory of a particular phenomenon. The researcher then forages in the library, locates the articles, photocopies them, and takes them to his home or office. In animals, such foraging activity frequently involves hoarding—gathering food, not for immediate consumption, but for future use. (Ikemoto et al. [1999] report that rats with disrupted dopamine transmission or nucleus accumbens lesions will gather food and perhaps take it to another place to satisfy current hunger, but they will not collect it and move it to a new location for future consumption.) Similarly, a scholar's gathering of materials may also be viewed as hoarding items that predict future reward. We can thus hypothesize that the researcher's foraging for and hoarding of items which may be relevant to a scholarly goal is likewise guided by the nucleus accumbens dopamine system.

To expand upon our analogy, let's suppose that on the weekend the scholar chooses one of the foraged articles and begins to read it. If the article does indeed provide information perceived as useful for the research goal, it will be positively appraised and its source (the article) is likely to be represented in the researcher's declarative memory. Associations will be made with the title of the journal and with the names of the author(s) for future foraging and gathering. Reading the article constitutes exploratory/investigative behavior, behavior which we can again hypothesize is stimulated by the dopamine-nucleus accumbens mechanism (which may also potentiate further cognitive/motor foraging behaviors, such as underlining, taking notes, identifying references in the text for further investigation, etc.). Such activities mediate the acquisition of knowledge that will contribute to the scholar-forager's goal to develop his argument/model/theory.

Based on Ikemoto et al.'s (1999) perspective, we might speculate that if the researcher's nucleus accumbens dopamine release were, for some reason, disrupted, he might nevertheless engage in mental foraging activities—but with less focus and less flexibility, because he might not as readily recognize pieces of information as incentive stimuli—i.e., as relevant to his goal. In fact, given sufficient dopamine depletion, the researcher might abandon foraging (such as would be constituted by his reading of the articles) altogether.

Another scenario—one not involving learning—might facilitate speculation about how the nucleus accumbens dopamine mechanism helps humans identify stimuli incorporating incentive information that can be used to accomplish a goal. When traveling someplace unfamiliar by car, one frequently consults a map and plots a route from one's home to the desired location. On the map, relevant streets, intersections, parks, monuments, buildings, street numbers, etc. will be identified. These landmarks constitute incentive stimuli. During the trip, when they are recognized in the actual environment, they will constitute predictors of reward and we can speculate that their recognition will stimulate dopamine release. Essentially, such positively valenced stimuli act as "go" signals (Rolls, 1999) that indicate that the traveler is on the right track and should continue. Suppose that, on the other hand, the expected landmarks fail to appear as the driver attempts to navigate his way. If this were to occur, we would speculate that the driver's dopamine activity would become depressed, acting now as a signal to do something different, such as to examine the map again or to ask someone for directions.

What I have suggested so far is that a neurobiological circuit consisting of the amygdala, the orbitofrontal cortex, and the body proper—along with dopamine innervation of the striatum—constitutes the brain mechanism for stimulus appraisal, motivation, and the cognitive/motor activities that are involved in identifying and in engaging stimuli that will lead to the acquisition of desired knowledge or skills. The model proposed here provides a mechanism which guides learners' efforts to locate and interact with incentive stimuli that facilitate goal achievement. A future development of this model will be an account of how the information contained in the stimuli engaged during motor and mental foraging becomes encoded in the brain.

Decision-Making in Language Pragmatics

The major components of the stimulus appraisal system (amygdala, orbitofrontal cortex, and body proper) also seem to be important neural structures for social cognition (Adolphs, 1999b; Brothers, 1990, 1997; Schumann, 1997, 1999). In addition, Damasio (1994), Anderson et al. (1999), and Bechara et al. (2000) show that this system (and especially the orbitofrontal cortex) is important in reasoning and in decision-making about social and personal issues. Schumann (1999) argues that such reasoning and decision-making—as well as the hypothesizing about the intentions and dispositions of others—is done on an ongoing basis during the course of real-time language-use pragmatics.[2]

I have argued above that the amygdala is involved in recognizing and assessing novel stimuli; in detecting emotions (especially fear) in peoples' facial expressions; in determining the eye gaze of interlocutors; in judging the trustworthiness and approachability of individuals based on their facial expressions; in assessing the arousal level of conspecifics on the basis of facial expression; in responding to the threat content of words; in recognizing the function of intonation in sentences; and in identifying voices and the emotional quality of nonverbal sounds. Similarly, I have detailed how the orbitofrontal cortex is involved in tracking reward contingencies to determine whether a particular behavior is advantageous or detrimental; in recognizing and implementing rules for appropriate social behavior; and in keeping goals in mind.

These amygdala and orbitofrontal functions are intensely social. They are, therefore, crucially important in choosing what to say, how to say it, when to say it, and to whom to say it. In addition, such functions are essential for determining the intentions, desires, and emotions of one's interlocutors. Patients with amygdala or orbitofrontal damage are generally diagnosed as having "normal" language. Schumann (1999) suggests that such patients may actually have normal *grammar*, but impaired language-use *pragmatics*. In general, the pragmatic competence of such patients has not yet been studied.

While other parts of the brain are also involved in interpreting and emitting social signals,[3] the amygdala and the orbitofrontal cortex (in conjunction with the autonomic, endocrine, and musculoskeletal systems) seem to operate, at the most basic level, as an appraisal mechanism for determining the emotional, motivational, and incentive relevance of stimuli—including social stimuli, and, therefore, language. Thus, in its role as an evaluator of social signals, this neural appraisal system appears to be a reasonable candidate for the neural mechanism that subserves decision-making in language pragmatics.

Conclusion

This chapter has attempted to show how stimulus appraisal, foraging, and social cognition are implemented largely by the same neural system. Extending this view, I have argued that motivation in second language acquisition, cognitive/motor exploratory activity in learning (with specific reference to second language learning), and decision-making in language pragmatics may actually result from the same brain mechanisms. This perspective provides some consilience in applied linguistics by demonstrating an essential unity at the biological level for three areas that seem quite different at the psychological level.

In addition, this biological perspective allows us to talk about actual material components of the system (amygdala, orbitofrontal cortex, striatum, dopamine, etc.), providing a specificity that can contribute to our understanding of the biology underlying psychological constructs. Although such specificity requires the introduction of substantial neurobiological terminology, it has the advantage of allowing the model to be adjusted as new information is discovered about the functions of the neural substrate. Thus, because of the enormous amount of neurobiological research being produced, refinements in the model will be possible on a regular basis. In addition, such specificity will facilitate the actual testing of the model as new developments in non-invasive neuroimaging technology become available. Therefore, I believe that the continued integration of psychology and neurobiology will contribute significantly to our knowledge of issues important to the field of applied linguistics.

Notes

1. In the Stroop test, subjects are presented with a list of color names (*blue, red, green,* etc.) that are printed in non-corresponding colors (the word *blue*, for example, might be printed in red ink, and vice-versa). The test measures the ability of subjects to identify the color of the print while repressing the tendency to read the color name instead.

2. This link is implicitly recognized by Damasio (1994) in his observation that reasoning involves "choosing a nonverbal action, a word, a sentence or some combination thereof, among the many possible at the moment, in connection with a given situation" (p. 165).

3. Adolphs (1999) reports that areas in the right somatosensory cortex (including regions known as SI, SII, and insula) are particularly important in recognizing blends of emotions in conspecifics' faces. Brothers (1997) reports that in primates, neurons in the superior temporal sulcus are responsive to faces—including conspecifics' eye movements, head, and gaze direction. She also points out that neurons in the inferior temporal cortex respond to faces and become active when a monkey observes a conspecific walking. The superior temporal sulcus and the inferotemporal cortex have reciprocal connections with the amygdala (Amaral, Price, & Pitkanen, 1992). For discussion, see Schumann (1999).

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Adolphs describes how the amygdala, orbitofrontal cortex, somatosensory areas, and the peripheral nervous system underpin social cognition, the ability to reason about social and personal issues, and to make hypotheses about the dispositions and intentions of others.

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3. NEW THEMES AND APPROACHES IN SECOND LANGUAGE MOTIVATION RESEARCH

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The study of L2 motivation has reached an exciting turning point in the 1990s, with a variety of new models and approaches proposed in the literature, resulting in what Gardner and Tremblay (1994) have called a 'motivational renaissance.' In this chapter I provide an overview of some of the current themes and research directions that I find particularly novel or forward-looking. The summary is divided into three sections: theoretical advances, new approaches in research methodology, and emerging new motivational themes. I argue that the initial research inspiration and standard-setting empirical work on L2 motivation originating from Canada has borne fruit by 'educating' a new generation of international scholars who, together with the pioneers of the field, have applied their expertise in diverse contexts and in creative ways, thereby creating a colorful mixture of approaches comparable to the multi-faceted arena of mainstream motivational psychology.

The first three decades of L2 motivation research—until about the early 1990s—was largely inspired and fuelled by the pioneering work of social psychologists in Canada, most notably Robert Gardner, Wallace Lambert, Richard Clément, and their associates. Applying versions of a standardized motivation test developed by Robert Gardner's research group at the University of Western Ontario, the *Attitude/Motivation Test Battery* (AMTB; for a complete version, see Gardner, 1985), a great deal of empirical research during this period was directed at measuring the association between various aspects of motivation and L2 learning achievement. The emerging body of research studies established motivation as a principal determinant of second language acquisition, comparable in its impact to another well-researched learner variable, language aptitude.

During these first decades of research, motivation was primarily seen as a relatively stable learner trait that was, to a large extent, a function of (a) the learner's social perceptions of the L2 and its speakers, as reflected by various language attitudes; (b) generalized attitudes toward the L2 learning situation, such as the appraisal of the course or the teacher; and (c) interethnic contact and the resulting degree of linguistic self-confidence. The 1990s extended this conception by adding a number of cognitive and situation-specific variables to the existing paradigm (e.g., attributions and group cohesiveness), and there was a shift by some toward viewing motivation as a more dynamic factor that is in a continuous process of evolution and change according to the various internal and external influences the learner is exposed to (for a recent review, see Dörnyei, 2001). The traditional approach of computing correlations between motivational and achievement factors gradually gave way to more complex, often qualitative, analyses of motivational antecedents and consequences, resulting in a colorful spectrum of new research directions. This chapter is intended to survey these recent developments and highlight some potentially fruitful areas for future research. First I summarize some general theoretical and research methodological advances, then I describe a number of novel motivational themes emerging in the literature.

Theoretical Advances

The 1990s brought an extraordinary boom in L2 motivation research: Dörnyei (1998a) reviewed over 80 relevant L2 studies from the period, including more than ten newly designed theoretical motivation constructs. The extent of the shift in thinking is probably best characterized by the fact that a new motivation model developed by Robert Gardner's research laboratory (Tremblay & Gardner, 1995) in response to calls for the "adoption of a wider vision of motivation" (p. 505), did not actually include Gardner's best known motivational component, the 'integrative motive.' Approaching the new millennium, the boundaries of L2 motivation were pushed even further, with researchers adopting varied and increasingly complex perspectives. A good cross-section of the emerging new wave of motivational thinking was provided by a colloquium at the annual conference of the American Association for Applied Linguistics in March, 2000 (Vancouver), and by an edited volume—partly based on the colloquium proceedings—which contains 20 chapters written by researchers from over ten different countries in Asia, Europe, and the Americas (Dörnyei & Schmidt, 2001).

From the point of view of their theoretical novelty, the following five motivational areas appear particularly interesting: social motivation; motivation from a process-oriented perspective; the neurobiological basis of motivation (see also Schumann, this volume); L2 motivation and self-determination theory; and task motivation.

Social Motivation

In an article deliberating upon the future of applied linguistics, McGroarty (1998) has argued that in order to be able to address the "most intellectually challenging and practically significant aspects of language learning and teaching" (p. 592), applied linguists need to understand better how the *social contexts* surrounding language acquisition affect the learning process. This view accords with the recent emergence of a broader perspective in the whole of the social sciences—sometimes referred to as an ongoing "second cognitive revolution" (Hickey, 1997, p. 183)—that emphasizes the sociocultural roots of learning and cognition in general. Motivational psychology has not remained immune to the new spirit: in a pioneering article, Bernard Weiner (1994) set out to conceptualize *social motivation,* involving the complex of motivational influences that stem from the sociocultural environment rather than from the individual. During the past five years, social goals have been the subject of a great deal of research in psychology (cf., Juvonen & Nishina, 1997; Wentzel, 1999).

Because of the inherently social nature of L2 acquisition, the study of the linguistic impact of various sociocultural factors has, in fact, had a relatively long history in the L2 field. In addition to Gardner's motivation theory, social determinants of L2 learning were the focus of Giles and Byrne's (1982) intergroup model, Schumann's (1978) acculturation theory, and Clément and Noels's (1992; Noels & Clément, 1996) situated language identity theory, although these theories were not always expressed explicitly in motivational terms. In the light of the increasing social awareness in motivational psychology, this line of inquiry is of particular significance and, as emphasized by Clément and Gardner (in press), Dörnyei (in press-a), and McGroarty (2001), L2 motivation as a *situated construct* will undoubtedly be one of the main targets of future motivation research.

Motivation from a Process-Oriented Perspective

A recent line of investigation that I have been actively involved in has examined the *temporal dimension* of motivation, that is, the way in which motivational processes happen in time. This question is, I believe, particularly important when the target of interest is a sustained learning process, such as the mastery of an L2, that can take several years to be successfully accomplished. During the course of such a lengthy process, student motivation does not remain constant but undergoes continuous changes; as Ushioda (1996, p. 240) summarizes, "within the context of institutionalized learning especially, the common experience would seem to be motivational flux rather than stability." In view of this, the study of the dynamics of motivational change and the identification of typical sequential patterns and developmental aspects is likely to be a fruitful area for future research. Examples of a process-oriented conception in L2 motivation research include the separation of the *initiation of motivation* from the process of *sustaining motivation* by Williams and Burden (1997) and Ushioda's

(1998, 2001) analysis of how new motivational orientations evolve while the learner is engaged in the L2 learning process.

The most complex process-oriented construct in the L2 field has been put forward by Dörnyei and Ottó (1998; cf. also Dörnyei, 2001), who devised a *process model of L2 motivation* which organizes the various motivational influences along a sequence of discrete actional events in the chain of instigating and enacting motivated behavior. The model details how initial wishes and desires are first transformed into goals and then into operationalized intentions, which are seen as the immediate antecedents of action; after action has been initiated, an appraisal and an action control process mediate 'executive motivation,' leading (hopefully) to the accomplishment of the goal and concluded by the final evaluation of the process. In a recent paper summarizing theoretical and practical implications of the process-oriented approach, I have argued (Dörnyei, 2000) that focusing on the temporal aspect of motivation is particularly useful because it allows researchers to discuss both preactional 'choice motivation' (i.e., the motives leading to selecting goals and forming intentions) and volitional/executive factors during the actional phase (i.e., motives affecting ongoing learning behaviors) in a unified framework. Although this research perspective is still relatively new, during the past decade it has been adopted by a growing number of scholars within the field of educational psychology (cf., Snow, Corno, & Jackson, 1996), partly driven by recognition that, by accounting for the dynamic evolution of motivation, we can fully accommodate the learner's active role in controlling and shaping the affective foundation of the learning process. This perspective fits in well with the recent emphasis placed on the study of student self-regulation.

A Neurobiological Explanation of Motivation

A novel line of research that has the potential to revolutionarize the study of L2 motivation has been pursued by John Schumann (1998, 1999, this volume), who has examined second language acquisition from a neurobiological perspective. This work has been one of the first attempts in the L2 field to incorporate the findings of neuroscience and to link the study of language to this particularly dynamically developing discipline within cognitive sciences. The key constituent of Schumann's theory is *stimulus appraisal,* which occurs in the brain along five dimensions: *novelty* (degree of unexpectedness/familiarity); *pleasantness* (attractiveness); *goal/need significance* (whether the stimulus is instrumental in satisfying needs or achieving goals); *coping potential* (whether the individual expects to be able to cope with the event); and *self and social image* (whether the event is compatible with social norms and the individual's self-concept). These appraisals become part of the person's overall value system through a special 'memory for value' and are largely responsible for providing the affective foundation of human action. Recently, Schumann (2001) has broadened his theory by outlining a conception of learning as a form of *mental foraging* (i.e., foraging for knowledge), which engages the same neural systems as the ones used by organisms when foraging to feed or mate, and which is generated by an incentive motive and potentiated by the stimulus appraisal system.

Motivation and Self-Determination Theory

One of the most influential paradigms in mainstream motivational psychology has been offered by *self-determination theory* (Deci & Ryan, 1985; Vallerand, 1997), which includes the well-known distinction between *intrinsic motivation* (i.e., performing a behavior for its own sake in order to experience pleasure and satisfaction such as the joy of doing a particular activity or satisfying one's curiosity) and *extrinsic motivation* (i.e., performing a behavior as a means to an end, that is, to receive some extrinsic reward such as good grades or a raise in salary, or alternatively to avoid punishment). The theory places the various types of regulations on a continuum between self-determined (intrinsic) and controlled (extrinsic) forms of motivation, depending on how 'internalized' they are, that is, how much the regulation has been transferred from outside to inside the individual. Five distinct categories along this continuum have been identified: *external regulation* (i.e., motivation coming entirely from external sources such as rewards or threats); *introjected regulation* (i.e., externally imposed rules that students accept as norms they should follow in order not to feel guilty); *identified regulation* (i.e., engaging in an activity because the individual highly values it and sees its usefulness); *integrated regulation* (i.e., involving choiceful behavior that is fully assimilated with the individual's other values, needs, and identity); and pure *intrinsic regulation*.

Because learning an L2 almost always contains a combination of external and internal regulatory factors, Noels and her colleagues (Noels, 2001; Noels, Clément, & Pelletier, 1999; Noels, Pelletier, Clément, & Vallerand, 2000) set out to explore how the orientations proposed by self-determination theory relate to various orientations that have traditionally been identified in the L2 field (e.g., instrumental and integrative orientations). Noels argues that applying the intrinsic/extrinsic continuum can be helpful in organizing language learning goals systematically; she notes, further, that the paradigm is particularly useful for analyzing the classroom climate and the L2 teacher in terms of how much they promote either control or autonomy, a dimension of contrast which has immediate practical implications for educating autonomous, self-regulated L2 learners.

Task Motivation

While it is true that certain motivational perceptions and attributes are generalized across learning situations and remain fairly fixed once established, it is also clear that other motivational factors show considerable variation according to the particular learning event with which they are associated, as evidenced by the varying degrees of interest and commitment students demonstrate toward different *learning tasks*. This duality of generalized and situation-specific motives was explicitly addressed by Tremblay, Goldberg, and Gardner (1995) when they distinguished *trait* and *state motivation*, the former involving stable and enduring dispositions, the latter transitory and temporary responses or conditions. The potential usefulness of such a distinction lies in its capacity to explain learners' situational and task preferences. Indeed, from a pedagogical point of view, it would be very beneficial to identify components of *task motivation*, because it would allow curriculum designers and language teachers to systematically select and administer tasks in a motivating manner, thus increasing learner engagement.

In a recent theoretical discussion of task motivation, Julkunen (2001) argues that students' task behavior is fuelled by a combination of generalized and situation-specific motives according to the specific task characteristics, a position in line with Tremblay et al.'s (1995) conclusion that trait motivation influences state motivation. In a study focusing on the motivational background of student engagement in communicative L2 tasks, Dörnyei and Kormos (2000) found that the learner's overall disposition toward task performance has at least three distinct layers: (a) generalized motives (e.g., integrativeness), (b) course-specific motives (i.e., the appraisal of the L2 course), and (c) task-specific motives (i.e., attitudes toward the particular task). The need to distinguish between the latter two aspects which have traditionally been lumped together under the 'situation-specific' category was highlighted by the finding that, among the learners in our study who displayed low task-attitudes, those who had a favorable disposition toward the course in general participated more actively than those who had unfavorable attitudes toward both the course and the task. Furthermore, in discussing task motivation from a process-oriented perspective, I have argued elsewhere (Dörnyei, 2000) that in many learning situations there are various levels of increasingly focused task engagement (e.g., taking up studies in general, enrolling in a particular course, attending a particular lesson or carrying out a particular learning task) and that the resulting action-oriented contingencies, or mind sets, interact with each other in an as yet unspecified manner.

Finally, a further feature of task motivation which makes it a particularly intriguing research domain is the fact tha thet motivation of task participants is not independent of each other. It is easy to see that if one is paired up with a highly motivated or unmotivated partner, this pairing affects the person's own disposition toward the task; in other words, task motivation is *co-constructed* by the participants. I have found two sources of empirical evidence to support this claim in a follow-up to the Dörnyei and Kormos (2000) study (Dörnyei, in press-b): First, students with low task attitudes performed significantly better when their partner demonstrated high task attitudes. Second, correlations of the individual students' attitudes toward the course and the task with their task engagement index were .32 and .39, respectively, whereas the same correlations computed for the dyads' joint performance were .59 and .52, respectively. That is, when the two task participants' merged motivational and performance indices were correlated, the positive association was significantly higher.

New Approaches in Research Methodology

L2 motivation research has traditionally followed the principles of quantitative social psychology, making extensive use of the various rating scales developed for the measurement of attitudes. Data obtained by such scales have been typically processed by means of inferential statistical procedures, such as correlation or factor analysis. While this research tradition is still strong and some particularly large scale investigations have been reported on recently (e.g., Dörnyei & Clément, 2001: 4,765 primary school pupils in Hungary; Schmidt & Watanabe, 2001: 2,089 university students in Hawaii; Inbar, Donitsa-Schmidt, & Shohamy, 2001: 1,690 secondary school students in Israel), I consider it a significant step in motivation research that traditional quantitative research methodologies have been increasingly complemented by qualitative approaches. Interpretive techniques such as in-depth interviews or case studies are in many ways better suited to explore the internal dynamics of the intricate and multilevel construct of student motivation than quantitative methods, and the richness of qualitative data may also provide 'new slants on old questions' (Pintrich & Schunk, 1996). The potential of qualitative research methodology is well evidenced by a series of recent studies in this vein by Ushioda (1998, 2001), Williams and Burden and colleagues (1999, 2001), Nikolov (1999, 2001), and Syed (2001), focusing on issues as diverse as attributions, motivational development, classroom motives, self-motivation, and the motivational impact of the learner's self-concept.

Quantitative research methodology has not remained unchanged either: the most significant advance in this area has probably been the increasing application of structural equation modeling (SEM) to interpret large, multivariate datasets. Although LISREL models have been used in L2 motivation research since the early 1980s, the past five years have seen an increase in the utilization of the procedure, partly because SEM programs have become easier to handle and more readily available (e.g., as part of SPSS). Recent studies employing SEM techniques include Gardner, Masgoret and Tremblay (1999), Gardner, Tremblay, and Masgoret (1997), Laine (1995), Masgoret and Gardner (1999), and Yamashiro & McLaughlin (2000). Paul Tremblay (2001) offers a very useful methodological overview of how to apply the procedure to best effect.

Emerging New Motivational Themes

In the final section of this chapter, I would like to highlight a number of particularly interesting new research topics that have received attention during the past few years. This selection is necessarily subjective and the coverage of the various topics will be brief.

Teacher Motivation

Although there is ample indirect evidence that the teacher's own level of motivation is 'infectious,' that is, it has a significant impact on the students' learning commitment, hardly any research has been done in the past to explore this relationship. Recently, however, a number of theoretical and empirical studies have addressed the issue, providing a firm foundation for future research. Drawing largely on the (limited) work in mainstream psychology and the pioneering research in the L2 field by Pennington (1995) and Doyle and Kim (1999), I devoted a whole chapter in my general overview of L2 motivation (Dörnyei, 2001) conceptualizing and analyzing *teacher motivation*. During the past 18 months, some further data-based studies have contributed to our understanding of what makes teachers motivated and how this motivation is reflected in their students' achievement in work by Jacques (2001), Kassabgy, Boraie, and Schmidt (2001), and Masgoret, Bernaus, and Gardner (2000).

Motivation and Learning Strategy Use

The relationship between learning strategy use and student motivation has been an issue of interest in educational psychology for a decade. Learning strategies are techniques that students apply of their own free will to enhance the effectiveness of their learning; in this sense, strategy use, by definition, constitutes instances of motivated learning behavior. This close relationship between learning strategies and student motivation has been reflected by the fact that a well-known motivation test in educational psychology, the *Motivated Strategies for Learning Questionnaire* (*MSLQ*; Pintrich, Smith, & McKeachie, 1989) provides a combined measure of university students' motivational orientations and their use of different learning strategies. Recently Brown, Cunha, Frota, and Ferreira (2001) have produced a Portuguese version of the test for the purpose of administering it in Brazil. In the L2 field, the systematic study of the interrelationship between motivation and learning strategy use was initiated in the mid-1990s by Schmidt, MacIntyre, and colleagues (e.g., MacIntyre & Noels, 1996; Schmidt, Boraie, & Kassabgy, 1996); building on these results, Schmidt and Watanabe (2001) have recently further investigated the topic by obtaining data from over 2,000 university students.

Demotivation

Motivation research typically conceptualizes a 'motive' as a kind of 'inducement,' that is, as a positive force whose strength ranges on a continuum from zero to strong. However, very little is usually said about motivational influences that have a detrimental rather than a positive effect on motivation, that is, which instead of energizing action, 'de-energize' it. This gap is all the more surprising because in educational contexts 'demotivation' is a regrettably common phenomenon. In a review of the few relevant L2 studies available (Chambers, 1993; Dörnyei, 1998b; Oxford, 1998; and Ushioda, 1998), I have concluded that demotivation is a salient phenomenon in L2 learning and that teachers have a considerable responsibility in this respect (Dörnyei, 2001). Of course, when interpreting demotivated student responses, we need to bear in mind Chambers's warning that we are living in an age when it is not 'cool' for students to show enthusiasm for anything and "Boredom is in" (p. 14). In any case, much further research is needed to do this important motivational factor justice.

Willingness To Communicate (WTC)

A recent extension of motivation research with both theoretical and practical potential involves the study of the L2 speakers' *willingness* to engage in the act of L2 communication. Originally inspired by research in L1 communication studies (e.g., McCroskey & Richmond, 1991), MacIntyre, Clément, Dörnyei, and Noels (1998) have attempttd to conceptualize *willingness to communicate* (WTC) in the L2, thereby explaining the individual's "readiness to enter into discourse at a particular time with a specific person or persons, using a L2" (p. 547). The L2 WTC construct we have conceived is made up of several layers and subsumes a range of linguistic and psychological variables, including linguistic self confidence (both state and trait); the desire to affiliate with a person; interpersonal motivation; intergroup attitudes, motivation and climate; parameters of the social situation; communicative competence and experience; and various personality traits. Thus, the model attempts to draw together a host of learner variables that have been well established as influences on second language acquisition/use, resulting in a construct in which psychological and linguistic factors are integrated in an organic manner. This line of inquiry may well have important educational implications in that generating a willingness to communicate in the foreign language is arguably a central—if not *the* most central—objective of modern L2 pedagogy. The study of the nature of WTC is an ongoing research effort (cf. e.g., MacIntyre, Babin, & Clément, 1999), and the WTC construct has also been successfully integrated as a predictor variable accounting for a very significant proportion of the variance in learner performance in the Dörnyei and Kormos (2000) study already mentioned.

Motivating Language Learners

From a practicing teacher's point of view, the most pressing question related to motivation is not *what* motivation is but rather *how* it can be increased. It is an unflattering indication of the detachment of research from classroom practice that very little work has been done in the L2 field to devise and test motivational strategies systematically. To be fair, some practical recommendations have been offered by Alison (1993), Brown (1994), Chambers (1999), Dörnyei (1994), Oxford and Shearin (1994), and Williams and Burden (1997), but largely without any firm theoretical or empirical basis. The neglect of the study of motivational strategies is due in part to the fact that the experimental research required to test the effectiveness of a strategy is rather labor-intensive, and as Gardner and Tremblay (1994) summarize, offers many methodological pitfalls.

The only published empirical study on motivational strategies that I am aware of in the L2 field is a teacher survey that I conducted with a colleague (Dörnyei & Csizér, 1998) in which we asked 200 teachers to rate the importance of a set of 51 strategies and to estimate how often they used the strategies in their own practice. As a result, we compiled a list of "Ten commandments for motivating language learners." In addition, I have recently completed a systematic overview of all the major motivational strategies that have been documented in the educational psychological and second-language literature and summarized the findings in a teacher's handbook (Dörnyei, in press-c).

There are two further areas related to the question of how to motivate learners: the issues of *motivational change* and *motivational self-regulation*. With regard to the former, there have been a number of empirical studies in L2 motivation research investigating the motivational effects of bicultural excursion programs, methodological interventions, intensive language programs, and study trips abroad (for reviews, see Gardner, 1985: Ch. 5; MacFarlane & Wesche, 1995; Morgan, 1993). Two recent large-scale investigations conducted in this vein are Inbar, Shohamy, and Donitsa-Schmidt (1999) and Inbar, Donitsa-Schmidt, and Shohamy (2001), both examining how the teaching of spoken Arabic affects the attitudinal/motivational disposition of Israeli school children.

Motivational self-regulation, or *self-motivation*, is an intriguing new area within motivational psychology, exploring ways by which we can endow learners with appropriate knowledge and skills to motivate themselves. Evidence that this idea is not completely naïve has been provided by the fact that in certain classrooms, even under adverse conditions and without any teacher assistance, some learners are more successful in keeping up their goal commitment than others. How do they do it? The only answer is that they apply certain self-management skills to overcome environmental distraction or competing/distracting emotional or physical needs/states. Ushioda (1997, 2001) analyzes several of the positive motivational thinking patterns that help someone to keep going. Based on Kuhl's (1987) and Corno and Kanfer's (1993) pioneering taxonomies, I have suggested (Dörnyei, in press-c) that self-motivating strategies are of five main types: commitment control strategies, metacognitive control strategies, satiation control strategies, emotion control strategies, and environmental control strategies. Some of the actual strategies listed under these categories are, in fact, very similar to the 'affective learning strategies' conceptualized by Oxford (1990) and O'Malley and Chamot (1990).

Conclusion

This brief and necessarily sketchy overview has hopefully demonstrated that L2 motivation research is currently flourishing. The pioneers of the field have been joined by a new generation of international scholars and the scope of motivation research has been extended to cover a variety of related issues. As a result, we now have a vibrant mixture of approaches to the understanding of L2 motivation, comparable on a smaller scale to the multi-faceted motivational arena in psychology generally. The renewed interest in L2 motivation is at the same time indicative of a more general trend in applied linguistics whereby an increasing number of scholars combine psychological/psycholinguistic and linguistic approaches in order to better understand the complex mental processes involved in second language acquisition.

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Gardner and Clément's chapter in the first edition of *Handbook of Language and Social Psychology* provided an excellent summary of the social psychological perspectives on second language acquisition, and the authors have now completely revised their chapter for the second edition.

Dörnyei, Z. (2001). *Teaching and researching motivation.* Harlow, England: Longman.

This book offers an up-do-date overview of L2 motivation research from three broad perspectives: (a) theoretical approaches (both in mainstream psychology and in L2 studies); (b) pedagogical implications (including motivational strategies, demotivation, and teacher motivation); and (c) research methodology. It also contains a section offering a variety of resources such as lists of relevant databases and actual motivation questionnaire items successfully used in the past.

Dörnyei, Z., & Schmidt, R. (Eds.) (2001). *Motivation and second language acquisition* (Technical report #23). Honolulu, HI: University of Hawaii, Second Language Teaching and Curriculum Center.

This edited volume, containing 20 newly written chapters, offers a representative cross-section of contemporary motivation research in the L2 field. Authors include some of the field's most established researchers from over ten different countries in Asia, Europe, and the Americas.

Eccles, J. S., Wigfield, A. & Schiefele, A. (1998). Motivation to succeed. In W. Damon & N. Eisenberg (Eds.) *Handbook of child psychology* (5th ed.), *Vol. 3: Social, emotional, and personality development* (pp. 1017–1095). New York: John Wiley and Sons.

This is a very thorough review of the most recent literature in mainstream motivational psychology, also covering a number of cutting-edge research directions, particularly within the area of social motivation.

Pintrich, P. R., & Schunk, D. H. (1996). *Motivation in education: Theory, research, and applications*. Englewood Cliffs, NJ: Merrill.

This authoritative summary of research on motivation to learn by two of the leading American experts is a must for anyone interested in motivation on any sort of professional basis.

Ushioda, E. (2001). Language learning at university: Exploring the role of motivational thinking. In Z. Dörnyei & R. Schmidt (Eds.) *Motivation and second language acquisition* (pp. 91–124). Honolulu, HI: University of Hawaii, Second Language Teaching and Curriculum Center.

This extensive paper provides evidence of the richness of data that a qualitative study on motivation can offer. The author presents some groundbreaking insights into the dynamics of motivational processes over time as well as into language learners' self-motivating capacity.

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4. LANGUAGE ATTRITION: THE FATE OF THE START

Lynne Hansen

This chapter reviews the literature on psycholinguistic aspects of language attrition over the past half decade. Descriptive data-based studies have continued to dominate during this time, providing needed groundwork for the emerging discipline. A few studies have continued theoretical threads from previous work, however, by examining attrition data from the perspectives of the regression hypothesis and markedness theory. We have also seen the beginnings of promising new lines of research which draw theoretical underpinnings from neighboring disciplines, most notably from the savings paradigm in cognitive psychology and from theories of codeswitching in bilingualism studies. Evidence on the effects in attrition of non-linguistic variables such as age, proficiency level, and literacy has continued to accumulate. Hesitation phenomena in attriter speech have begun to receive serious attention. Relearning, one of the main areas to potentially benefit from language attrition studies, is also gaining new research impetus at the turn of the century.

The first review of language attrition to appear in the *Annual Review of Applied Linguistics* described developments in this subfield of applied linguistics from its inception in 1980 through the next fifteen years (de Bot & Weltens, 1995). The present review follows up on that state of the art paper to address the "fate of the start" (O'Connell & Wiese, 1987), that is, the progress made over the last five years in language attrition research. As in the earlier review, the primary focus is on non-pathological loss examined from psycholinguistic perspectives.

Since "the start," the expansion of interest in language attrition can be seen in a bevy of books (Hansen, 1999; Kenny, 1996; Kouritzen, 1999; Waas, 1996; Yukawa, 1997, 2000) and dissertations (Ammerlaan, 1996; Bolonyai, 1999; Dugas, 1999; Koepke, 1999; Pries, 1999; Schmid, 2000; Yagmur, 1997), and a succession of symposia on the subject at applied linguistics conferences; see Hansen (2000) for details.

One might ask what impels this interest in language forgetting. On the one hand, language attrition research supplies empirical foundations needed for practice in language planning and language education. On the other, the motivations are theoretical. Language attrition, whether in a first language or a second, is increasingly recognized as a normal part of changes in proficiency over time. Attrition research provides another window on the dynamism of language, another testing ground for extant theories of language development.

Increasingly since "the start," the study of language loss overlaps with related fields in its concerns and methods. In fact, according to de Bot (1999), language attrition is becoming a part of the field of second language acquisition:

> There are remarkable parallels with respect to the topics studied [between language attrition and SLA]: the roles of cross-linguistic influence, age, individual differences, language setting, social-psychological factors such as attitudes and motivation in language attrition. There is also a fairly recent interest in the psycholinguistics of language attrition, which links the topic with the long-established one of memory research in psychology (p. viii).

Despite earlier lack of agreement on definitions and terminology in language loss research (Waas, 1996), there now seems to be a consensus on key terms. *Language loss* is a general term applied to any instance of the decline of linguistic skills, whether of individuals or speech communities. *Language attrition*, our topic here, refers to the gradual forgetting of a language by individual *attriters*, persons who are experiencing attrition. This is distinguished from the longstanding sociolinguistic tradition of research on *language shift,* where the focus is on groups of speakers. The distinction is also made between first (L1) and second language (L2) attrition. The L1 and L2 loss described in the language attrition literature are more similar than L1 and L2 acquisition, however, since, in both L1 and L2 attrition there are usually two linguistic systems involved, an attriting language (LA) and a replacing language (LR).[1]

Whence a Theory?

While descriptive data-based studies continue to dominate in the field, the past five years have also seen the beginnings of promising new lines of theoretically motivated research. From studies of codeswitching in bilingualism, Bolonyai (1998, 1999, 2000) drew upon a theoretical framework composed of three interrelated models: the extended Matrix Language Frame (MLF) model (Myers-Scotton, 1997), the 4-M model, and the Abstract Level model (Myers-Scotton & Jake, 1999). The same set of principles which constrain the structural configurations in bilingual speech generally are said to operate in language attrition.

Bolonyai (1999) was the first to use hypotheses derived from the Myers-Scotton and Jakes models for examining a context of language attrition. In her analysis of the speech of L1 Hungarian children in an English milieu, she found asymmetries in the production of Hungarian preverbs and case suffixes. These were attributed, in part, to differences in the abstract properties of the morphemes. The researcher concludes that her findings "provide clear empirical support for the hypotheses of the 4-M model and Abstract Level model" (Bolonyai 2000, p. 104). No doubt further applications of this approach to issues in language loss will follow.

A few studies in the late 90s tested the Regression Hypothesis, the idea that a language is lost in the reverse order of that in which it had been learned. The theory was shown to predict attrition sequences in three contexts: the loss of Japanese negation (Hansen, 1999) and of Japanese and Chinese numeral classifiers (Hansen & Chen, 1999) by English speakers who had learned the L2 years earlier as young adults while working in the target culture; and the loss of Japanese negation by elderly Micronesians who had learned the language as children during the Japanese occupation of their islands (Hayashi, 1999). Regression is also implied in longitudinal studies which found that structures characterized by weak performance at initial testing declined significantly with disuse, while structures characterized by strong performance were more robust, as in Smith's (1995) study of the loss of L2 Spanish verb forms by adults in the United States. Since not all previous research findings have been compatible with regression theory, however, Hansen (1999) concludes that, "the question to be asked is no longer *whether* regression is operative in the loss of grammatical structures (in some cases it appears to be, in others not), but rather *when* and *under what conditions* its predictions hold true, and what the causal mechanisms are" (p. 150).

In the study of the learning and loss of Japanese and Chinese classifiers mentioned above, markedness theory came into play as well (Hansen & Chen, in press). An implicational scale of markedness was proposed, based on the semantics, frequency, and historical development of classifiers in many languages. Both acquisition and attrition data in this large cross-sectional study showed general conformity to the constraints of the hierarchy. Exceptions, two classifiers learned earlier and retained longer than predicted, were highly frequent in the speech of the particular population under study. Apparently, frequency in input can be a powerful enough influence to modulate the path of least resistance imposed by markedness constraints. Another theoretical perspective recently taken from a neighboring field by language attrition researchers is the savings paradigm drawn from cognitive psychology (de Bot & Stoessel, 1998, 1999) which will be discussed in the section on language relearning.

Hesitation Phenomena in Attriter Speech

In their 1995 review, de Bot and Weltens concluded that an alternative to determining what part of the language is actually lost is "that the whole process of attrition can be explained by a change in processsing procedures"(p. 157). This insight comes in part from a number of studies in which subjects rated their proficiency levels to be far lower than indicated by untimed tests (Weltens, 1989, Waas, 1996). For example, attriters of French in the Netherlands believed that their proficiency in French had deteriorated dramatically while their performance on tests showed hardly any signs of attrition (Weltens, 1989). De Bot and Weltens, (1995) explain this phenomenon in a vivid account of the attriter experience:

> Through non-use, the availability of lexical elements decreases. When enough time is available for a searching processs, then most pieces of information can be found. . . . With normal speech rates, words have to be retrieved at a rate of four to five words per second (Levelt 1989). . . and a slowed down system will not be able to find the right words in time. Through different compensatory strategies language users . . . find the right word. . . . Language attriters know that their retrieval is slowed down when they are forced to come up with the right word in time, and so they (rightly) say that they have experienced language attrition in their second language (p. 157).

This viewpoint follows the psychological literature in assuming that everything learned is still there. The first sign of language attrition then is not the 'loss' of certain items but rather an increase in the length of time needed for their retrieval. In following up on this insight, a few attrition researchers have attempted to examine the time factor through timed experiments (Grendel, 1993, Waas, 1996). The bulk of the work on temporal aspects of language loss, however, has involved the quanitification of hesitation variables in spontaneous speech.

Despite the long history of the study of hesitation behavior in native-speaker and second language speech, it has been only in the last half decade that much attention has been given to pause phenomena in attriter speech. This work, summarized in Table 1, has for the most part incorporated temporal variables taken from the pausology literature: silent pauses (SP); filled pauses (FP) (voiced fillers which do not contribute lexical information, such as, *uh, um, well* in English); rate of speech; amount of talk (verboseness); self repairs; and repetition.

Table 1: Attrition Studies Incorporating Hesitation Variables

	Subjects	Variables Studied	Attriting Language	Replacing Language
Kenny (1996)	24 adults	[verboseness], [rate], **repair**, [FP frequency], [SP frequency] [lengthening]	L1 Arabic	L2 English
Russell (1996)	12 adults	FP (LA), FP (LR), repair, repetition, **SP (as % of total speech time)**	L2 Japanese	L1 English
Nakuma (1997)	13 adults	**SP time, repetition time**	L3 Spanish	L2 English
Yukawa (1997, 1998)	2 children	**SP frequency**	L1 Japanese	L2 English
Hansen et al. (1998)	82 adults	verboseness, rate, FP frequency (LA), **FP frequency (LR), SP frequency, SP time**	L2 Japanese	L1 English
Yoshitomi (1994, 1999)	4 children	verboseness, FP frequency, **repair, false starts**	L2 English	L1 Japanese
Tomiyama (1999)	1 child	**SP frequency, SP time, repair, repetitions, code-switching**	L2 English	L1 Japanese
Nagasawa (1999)	7 adults	[rate], [SP time], [FP time]	L2 Japanese	L1 English
Hansen et al. (2000)	70 adults	FP frequency (LA), FP time (LA), SP frequency, SP time, laughter frequency, laughter time	L2 Japanese	L1 English

Variables which, according to the researcher, changed over the attrition period are in bold print. Variables yielding mixed or uninterpretable results are in brackets.

The first full-blown foray into the use of quantitative analyses of hesitation phenomena to trace the stages of language attrition is Kenny's (1996) study of the L1 Arabic attrition of Palestinian immigrants in the United States. Proposing to incorporate the experimental rigor and cognitive focus of traditional hesitation analysis into attrition research, Kenny put forward well-formulated questions and specific measures for a wide variety of hesitation variables.

In contrast to Kenny's sole focus on hesitation, several subsequent studies have used pause variables in tandem with various measures of language proficiency (Nagasawa, 1999, Tomiyama, 1999, Yoshitomi, 1999). For example, Yukawa (1998), in her longitudinal investigation of L1 Japanese attrition and relearning, used six types of analysis to examine language structures, along with two to examine language processing: a silent pause analysis and elicited imitation task. Although the intra-constituent (intra-*bunsetsu*) pauses which she quantified yielded insufficient numbers to provide much evidence on fluency, Yukawa's rich data did allow her to present a convincing picture of processing inhibition that developed in her subjects. With the specific purpose of relating pause variables to measures of language competence, Hansen, Gardner, and Pollard (1997) and Hansen and Stokes (1997) analyzed storytelling data from 40 L2 learners of Japanese in Japan and 82 attriters from the same population back in the United States. Correlations of the pause variables with scores from three proficiency measures showed that rate and amount of speech and the frequency of Japanese filled pauses had little relationship to L2 attainment. The frequency of English filled pauses, e.g., *uh, er,* in the Japanese narratives related significantly to proficiency, however as did silent pauses, both in frequency and length. This fits well with the findings of Russell's (1996) longitudinal study of subjects from the same population of adults over the first half decade after their return from Japan. Hesitation variables were examined in oral monologues collected from twelve attriters in three sessions about a year apart. Despite detailed analyses, only one of the pause variables, silent pause length, was significantly different over the three elicitation times. Clearly, silent pause is a piece of the language attrition puzzle, but needs to be examined in various attrition contexts and elaborated through more fine-grained analyses which take into account location as well as length and frequency of pauses.

Variables Affecting Language Attrition

The potency of variables shown previously to interact with language attrition has been investigated further in recent studies. Further evidence has accumulated that older children retain linguistic knowledge better than younger (Yukawa, 1997, Taura, 1999), and that higher proficiency in the attriting language leads to better retention (Kaufman, 1997, Reetz-Kurashige, 1999). Higher reading and writing skills also relate positively to greater language stability, but the confounding effect of age and proficiency level on the literacy variable is recognized. (Yukawa, 1997, Reetz-Kurashige, 1999). This effect has been impossible to control in studies of children because the older ones who retain a language better than the younger also have higher proficiency and more developed literacy skills.

However, in a recent series of studies we have nevertheless been successful in separating out the literacy variable in a population of adult attriters. Three disparate writing systems were represented in the attriting languages: Japanese (Hansen & Newbold, 1997), Chinese (Hansen & Chantril, 1998), and Korean (Shewell & Hansen, 1999). The individuals in this population attain high levels of oral competence during two years of daily interaction in the target culture; at the same time, they vary considerably in the extent to which they learn to read and write their second language. An original intent of the research was to examine differential literacy effects related to the scripts used for the L2s, since there is now evidence from aphasia studies that logographic and phonologically based writing systems are stored differently in the brain (Paradis, Hagiwara, & Hildebrandt, 1985). In all three of the cross-sectional studies, however, the literacy effect was highly potent, and the number of logographs that had been learned stood out consistently as a robust predictor of language retention over periods spanning forty years. With the introduction of an affective component into the design of the third study (Shewell & Hansen, 1999), however, a path analysis indicated that both the higher literacy and better L2 maintenance were attributable to a third factor, the learner/attriter's language attitudes and motivation.

Relearning

As pointed out in de Bot & Weltens (1995), one of the main applications of language attrition research is to the area of relearning. Yet, until this past half decade, the regaining of forgotten language had received little attention. The new impetus to this area of study has come from the recent application of the savings paradigm from cognitive psychology to the study of relearning (de Bot & Stoessel, 1998, 1999; Hansen & Asao, forthcoming; Hansen, Umeda, & McKinney, 2000); from Yukawa's 1997 dissertation (see annotation); and from a project being carried out in Germany at Kiel University (Allendorf, 1980; Pries, 1999; 2000, Pries & Wode, 1995; Rohde, 1999; Sülzer 1998; Wode, 1996, 1997, 1998), from Yukawa's (1997) dissertation, and from the recent application of the savings paradigm from cognitive psychology to the study of relearning (deBot & Stoessel, 1998, 1999, Hansen, Umeda, & McKinney, 2000). The Kiel project examines the reacquisition of English by four German children from three perspectives: (a) comparison of the children's reacquisition of English to their earlier acquisition, (b) comparison of their reacquisition of L2 English/L1 German to reports of reacquisition of other languages/learning situations; and (c) examination of whether or not the reacquisition of languages can be accounted for in terms of what is known about relearning in other behavioral domains.

So far, the recent studies, along with the previous scant literature on language relearning, indicate that, for children at least, learning a language a second time can be dramatically more rapid than the first (Berman, 1979; Slobin, Dasinger, Kyntay, & Toupin, 1993; Yukawa, 1997). Some studies report parallels between learning and relearning in developmental structures and sequences (Allendorf, 1989; Wode, 1996). The occurrence of fewer developmental structures has also been noted in the course of reacquisition, however (Hansen, 1980; Wode, 1996). In fact Yukawa (1997), finding little restructuring in the L1 regaining of her children, claims that attrition was the result of a processing failure to use knowledge that had remained virtually intact.

As noted above, among psychologists there is general agreement that information once learned is not lost. It becomes inaccessible with disuse, but is retrievable with the right cues. In pursuit of a means of accessing forgotten language, de Bot and Stoessel (1998) turned to the savings paradigm from cognitive psychology. A basic assumption of this approach is that even for language that can no longer be recalled or recognized, there are residues of knowledge that can be reactivated. Savings is defined by Nelson (1978) as a relearning advantage of old items over new items. The distinction is made between different levels of memory. For recall, a high level of activation is needed. For recognition, a lower level is sufficient. If the activation drops even further, then the item can no longer be retrieved. Through relearning, that is, the reintroduction of previously known material, old knowledge will become reactivated to a level that makes it retrievable. In contrast to this, new items, that is, items that have not previously been known, will not be able to reach the same level after only a brief learning period.

In two pioneering studies, de Bot and Stoessel (1998, 1999, 2000) applied this paradigm to the retrieval of lost second language vocabulary; in the first to a childhood language long forgotten by the adult subjects (see annotation), in the second to foreign languages being learned by college students in the classroom. In both instances, the presence in memory of words that could no longer be recalled nor recognized was substantiated. Extending this line of research, Hansen, Umeda, and McKinney (2000) found residual knowledge of forgotten vocabulary in second languages that had been learned by adults in a natural milieu. Language attrition projects designed to further exploit the savings paradigm are currently underway in four countries (for abstracts, see Hansen, 2000).

Conclusion

Attrition research in the past five years has elaborated the sequential picture sketched by de Bot and Weltens (1995) of language loss as a change in processing procedures. The work reviewed here on hesitation in speech illuminates the gradual increase in processing time for the retrieval of linguistic information, beginning in the initial stage of attrition. In the next stage the information becomes temporarily inaccessible under certain conditions, while still retrievable under others. Attrition sequences of linguistic items which are thus affected have been touched upon in recent theory-based studies (regression theory, markedness theory, and a theoretical framework from bilingual codeswitching) which suggest directions for future research. In the final stage of language attrition, the linguistic information becomes completely inaccessible. The continuing presence in memory of the "forgotten" language, however, is attested by recent studies of relearning based on the savings paradigm.

Notes

1. A frequently-used typology has categorized language attrition into four types according to the attriting language, L1 or L2, and the location in which loss occurs, L1 or L2 environment: (1) L1 loss in an L1 environment, (2) L1 loss in an L2 environment, (3) L2 loss in an L1 environment, and (4) L2 loss in an L2 environment. The vast majority of language attrition research that has been done, including all that is reviewed here, has looked at types 2 and 3 in which a language, L1 or L2, is lost as another language gradually replaces it.

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de Bot, K., & Stoessel, S. (2000). In search of yesterday's words: Reactivating a long forgotten language. *Applied Linguistics*, *21*, 364–384.

The importance of this pioneering work, first reported at AAAL 1998, can be gauged by the significant amount of interest it has already stimulated in applying the "savings" paradigm to language relearning. The researchers use this approach from cognitive psychology to address the fate of a forgotten language acquired during childhood. The two subjects, German adults who had spoken Dutch as children during a four year period of residence in the Netherlands, were tested thirty years later for residual knowledge of the forgotten language. Through the savings method, the existence of Dutch vocabulary knowledge was found. A strong cross-linguistic effect is reported, but non-cognate words were also retained. In laying the groundwork for future studies, the researchers caution of the potential difficulty in distinguishing between real memory and well-developed learning strategies. They also point out the importance of more exact documentation of attriters' earlier linguistic knowledge.

Hansen, L. (Ed.) (1999). *Second language attrition in Japanese contexts*. Oxford: Oxford University Press.

This is a collection of empirical studies conducted in contexts where Japanese was either the attriting language or the replacing language. An introduction reviews recent work in the field, discussing key variables and processes in second language loss and suggesting applications. The papers are in two sections: the loss of English by Japanese returnee children, and the loss of Japanese by adult foreigners. Shared findings of the returnee studies, in line with previous research, are that language retention increases with age for children, the amount of loss is somewhat proportional to the subjects' level of L2 proficiency, and, as length of disuse increases, linguistic characteristics of loss change. The accumulated effects of attrition of such subskills as lexical retrieval and accuracy in phonology, morphology, and syntax are examined. A new insight is that it is in the loss of the ability to coordinate subskills that erosion initially reveals itself, rather than in any measurable loss of individual ones (Yoshitomi, 1999). Thus, for language maintenance, situations which force spontaneous speech and coordination of linguistic subskills are seen as crucial. The second section describes the L2 Japanese attrition of English-speaking college students and former missionaries in the United States, and of elderly Micronesians in their island home. Evidence is presented on initial plateaus in the attrition of advanced learners, the critical threshold of proficiency for retaining a second language, the applicability of the regression hypothesis to the loss of morphosyntax, and the importance of affect in language attrition.

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In this important volume, Yukawa reports on the L1 Japanese loss of her two children while on sojourns in the United States and Sweden, and on their relearning of the language upon return to Japan. Following discussion of the state of the art in attrition research, the author discusses three case studies: H1 in Hawaii (ages 5;5 to 5;10), H2 in Stockholm (7;0 to 8;4) and S in Stockholm (3;10 to 5;3). As children of English teachers in Japan, both subjects (H and S) had been brought up bilingually from birth. The study examines their Japanese before and during the attrition period and during subsequent relearning. The three cases are compared based on lexical and syntactic analyses of spoken data and observation of comprehension and repetition tasks. Two qualitatively different attrition processes emerge from analyses. The two younger subjects (S and H1) lost the ability to produce sentences in Japanese in a few months, while comprehension appeared largely unaffected. The older child, though, suffered only minor loss of peripheral grammar and lexicon. Thus, it is hypothesized that there may be a certain age, attained by H2 but not by H1 and S, which serves as a prerequisite for a threshold level of language maintenance. Yukawa posits a *processing failure hypothesis* which predicts that, in the absence of constant exposure, young children suffer from processing failure of a once proficient language in spite of intact linguistic knowledge. This inhibition in speaking is discussed in relation to recent models of language production (de Bot, 1992; Levelt, 1989). Inaccessibility of the particles of the Japanese case-marking system is intimated as a triggering factor in the children's production failure.

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INDIVIDUAL DIFFERENCES

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5. AGE AND SECOND LANGUAGE ACQUISITION

David Singleton

The idea that there is an age factor in language development has long been—and continues to be—a hotly debated topic. This review begins by briefly revisiting some of the early perspectives on this issue; it goes on to sketch some of the relevant findings which emerged in the three decades following the onset in the late 1960s of serious empirical investigation of the age factor in L2 acquisition; and, finally, in the third section of the survey, it hones in on the results of some more recently published age-related research. The article concludes with a short discussion—in the light of the foregoing—of (a) the degree of absoluteness of the age factor in L2 acquisition; and (b) the notion that there may be not one, but a number, of age-related factors at work.

Early Perspectives

Much early writing on the age factor and L2 acquisition was based on anecdote and assumption. Tomb (1925) writes of the "common experience" in the days of the British Raj of hearing English children in Bengal fluently conversing with domestic staff in English, Bengali, Santali, and Hindustani, while their parents had barely enough Hindustani to issue orders. Stengel's (1939) Freudian analysis of the role of age in L2 learning is also based on mere impressionism. Penfield's advocacy of early exposure to L2s on purportedly neurophysiological grounds (Penfield & Roberts, 1959) in fact owes more to his own experience of immersing his children in German and French than to his work as a scientist (see Dechert, 1995). Even Lenneberg's contribution in the 1960s (Lenneberg, 1967) was based partly on folk wisdom, notably his claim—unaccompanied by evidence—that after puberty L2 learning requires "labored effort" and foreign accents cannot be "overcome easily."

Empirical Contributions from the Late 1960s Onwards

Age-focused research of the last thirty years or so has often been linked to the evaluation of early L2 instruction in schools. Such studies have consistently found a progressive diminution of any advantage conferred by early exposure to an L2 (see, e.g., Burstall, Jamieson, Cohen, & Hargreaves, 1974; Oller & Nagato, 1974; Stankowski Gratton, 1980). Investigations of "naturalistic" L2 acquisition yield a converse pattern. Subjects with several years' naturalistic experience of their L2 whose exposure to the L2 began in early childhood are found, on the whole, to outperform those whose L2 experience began in later years (see, e.g., Asher & García, 1969; Oyama, 1976, 1978; Patkowski, 1980); whereas studies of subjects with more limited naturalistic exposure to the L2 show older beginners outperforming younger ones (see, e.g., Ervin-Tripp, 1974), their advantage diminishing only after about a year (Snow & Hoefnagel-Höhle, 1978).

Krashen, Long, and Scarcella's (1979) review interprets the evidence as follows: while older beginners generally outperform their juniors initially—at least in morphology and syntax—in terms of overall long-term outcomes, broadly speaking, the earlier exposure to the L2 begins, the better. Because of findings from school contexts (see above), Krashen et al. restrict their claim to naturalistic L2 acquisition. However, one needs to bear in mind the blurring effect of mixing experimental and control groups in the same classes at the secondary level (Stern, 1976), as well as the vast differences in amount of L2 exposure provided by naturalistic and formal contexts, and the implication of such differences for "initial advantage" and "eventual effects" (Singleton, 1989, p. 236). The results of studies of L2 *immersion* programs, where amounts of exposure are much greater, "favor...early programs over delayed and, in most cases, late programs" (Holobow, Genesee, & Lambert, 1991, p. 180).

In studies conducted in the 1980s and 1990s, there has been some attention to cases of older beginners who attain very high levels of L2 proficiency. For example, Birdsong (1992) found that 15 out of 20 Anglophone adult subjects who began acquiring French as adults in France fell within the range of native speaker performance on a grammaticality judgment task; Ioup, Boustagui, Tigi, and Moselle's (1994) detailed study of two subjects who learned Arabic as adults in an Arabic-speaking environment established that both were attaining levels of performance close to native norms across a range of areas; and Bongaerts, Planken, and Schils (1995) demonstrated that Dutch learners of English who began learning English in a formal instructional setting after age 12 were able to attain English pronunciation ratings within the same range as those attained by native-speaker controls. This kind of evidence does not disturb the Krashen et al. view, which allows for departures from the general trend; however, it does have implications for more absolutist claims.

Such latter claims have focused on the proposition that there is a maturational limit (usually set around puberty) beyond which it is simply impossible to acquire an L2 (or certain aspects thereof) to native levels. Thus, Scovel (1988), restricting his claim to accent, affirms that those who begin exposure to an L2 after age 12 cannot ever "pass themselves off as native speakers phonologically" (p. 185). Long (1990, p. 274) reads the evidence on accent in precisely the same way, but also claims that the *sine qua non* for the acquisition of L2 morphology and syntax to native levels is experience of the L2 before age 15. The problem with such claims is that—quite apart from evidence from the work referred to in the previous paragraph—even studies which report mostly superior attainment by younger beginners often acknowledge that a minority of adolescent/adult-beginners perform at the same level as earlier beginners (e.g., Asher & García, 1969; Patkowski, 1980).

A further dimension of age-related L2 research in the 1980s and 1990s has been the emergence of findings apparently indicating that, while the putative decline in language-acquiring capacity may reach its culmination in adolescence, it has its onset around age 6 or 7. For instance, Johnson and Newport (1989) investigating the long-term attainments in English of immigrants to the USA as gauged by grammaticality judgment tests report that, while subjects who arrived before age 7 performed within the range set by native-speaker controls, performance levels declined linearly with age of arrival between age 7 and 15. Similar results are reported by Hyltenstam (1992). Such findings need, however, to be seen in the light of certain methodological criticisms (e.g., Kellerman, 1995).

A third focus of age-related L2 research has been the idea that children and adults may have fundamentally different processing mechanisms at their disposal. Thus, some adherents of the Universal Grammar (UG) school of thought (e.g., Bley-Vroman, 1989; Schachter, 1989) claim that post-pubertal L2 language learning has no access to UG principles and parameters. The empirical basis for this perspective was, let it be said, never conclusive (cf., for example, Flynn, 1987; Martohardjono & Flynn, 1995), and, as Braidi (1999) points out, recent changes in Chomskyan theory now render evaluation of earlier studies extremely difficult, although she also notes that "L2 learners do not seem to exhibit grammars that are not sanctioned by UG" (p. 67).

Beyond the confines of the Chomskyan magic circle, an interesting study conducted by Liu, Bates, and Li (1992) examines how age of first encounter with the L2 affects the processing of L2 sentences in terms of the use of word order and animacy as cues to interpretation by Chinese learners of English. Their results suggest that, whereas those who began to acquire English after age 20 transferred Chinese processing strategies into English, those who began before age 13 deployed the same strategies as monolingual English speakers.

Very Recent Age-Related Research

The pattern of age-related L2 research over the past three or four years has broadly continued that of the previous ten or fifteen. There have been further studies referring to late beginners who attain native-like levels of performance in the L2; there have been further studies looking at very early beginners; and there have been further studies addressing the question of whether post-pubertal L2 learning and use is subserved by different mechanisms from those subserving child language. Another feature of very recent work in this area has been a renewal of the search for explanations of age effects that do not rely on neurolinguistic arguments.

Concerning the achievements of late beginners, the work of Bongaerts and his colleagues has continued apace (Bongaerts, 1999). A further study has been conducted with respect to learning of English as an L2 by Dutch subjects (Bongaerts, van Summeren, Planken, & Schils, 1997), and there have also been studies of the learning of French as an L2 by Dutch subjects (Palmen, Bongaerts, & Schils, 1997), and the late learning of Dutch as an L2 (Bongaerts, Mennen, & Van der Slik, 2000). These studies essentially replicate the findings of Bongaerts et al.'s 1995 study showing that some learners whose exposure to an L2 begins after age 12 can nevertheless acquire an L2 accent which is perceived as native by native speakers.

A further study worth mentioning in this connection is Moyer's (1999) investigation of the L2 phonological attainment of 24 Anglophone graduates in German, none of whom had any exposure to German before age 11, employed as teachers of German at university level. In the main, the ratings for these subjects' German accents supplied by four native speakers did not overlap with those obtained by native speaker controls. However, one of the subjects *was* mistaken by the raters for a native speaker. This individual began learning German at age 22 and was largely self-taught. What distinguished him from his peers was a particularly deep fascination with the German language and culture and a particularly strong desire to sound German. Here, then, is a further example of a study showing an age effect in relation to ultimate L2 attainment which fails to operate across the board (see also DeKeyser, in press).

Turning now to research focusing on subjects whose L2 exposure began in early childhood, Kim, Relkin, Kyoung-Min, and Hirsch (1997) used magnetic resonance imaging to investigate the spatial representation of L1 and L2 in the cerebral cortex of early and late bilinguals during a sentence-generation task. The results revealed little or no age-related separation of activity in Wernicke's area, but differences did emerge with respect to activity in Broca's area. Among the late bilinguals, two distinct but adjacent centers of activation were revealed for L1 and L2, whereas in the early bilinguals, a single area of activation for both languages emerged. This looks like evidence of different kinds of brain organization in early and late bilinguals. Unfortunately, this study does not say anything very precise about the age at which separate representation of L1 and L2 is supposed to become characteristic: the early bilinguals were all exposed to the L2 during infancy, but the late bilinguals' mean age of initial exposure to the L2 was 11.2 years, which clearly leaves any question about the maturational point of divergence unanswered. Other studies based on brain-imaging techniques (see, e.g., Weber-Fox & Neville, 1999) have focused on differences in brain responses to semantic and grammatical anomalies in L2 stimuli; such studies indicate that the responses typical of subjects whose exposure to the L2 begins after age 11 differ from those typical of subjects whose exposure begins earlier. Concerning the question of the impact of a very early beginning, Marinova-Todd, Marshall, and Snow (2000, pp. 16–17) note that some of Weber-Fox and Neville's evidence seems to suggest that the determinant for response-types with respect to particular categories of grammatical anomaly is whether exposure begins before or after age four, while the watershed for response-types relative to other anomalies is age eleven.

On a completely different tack, a number of recent studies have indicated that even very young L2 beginners diverge at the level of fine linguistic detail from native speakers. Thus, for example, Hyltenstam and Abrahamsson (2000, p. 161) cite research by Ekberg (1998) into bilingual teenagers in Sweden exposed to Swedish outside the home as small children but whose output in Swedish differed in a number of lexico-grammatical respects from their native-speaker peers. At the phonological level too, it appears from Flege's work (e.g., 1999) that subjects who begin to be exposed to an L2 in an L2 environment as very young children are nevertheless quite likely to end up speaking the L2 with a non-native accent.

These neurolinguistically oriented studies bear on the issue of whether the processing mechanisms subserving language are different in children and adults. There has also been a continuation of research into the question of whether or not UG continues to be available as a support for language learning beyond childhood. There is no strong evidence that post-pubertal L2 learners do not have available to them the capacities which Chomskyans think of as deriving from UG; indeed, much recent research indicates that post-pubertal L2 learners deal in the same way as L1 acquirers with features purportedly having a UG basis (see, e.g., Bruhn de Garavito, 1999; Dekydtspotter, Sprouse, & Thyre, 1998).

A non-UG-focused study bearing on what underlies L2 learning at earlier and later ages is Harley and Hart's (1997) investigation of the role of different aspects of language aptitude in two groups of Anglophone secondary school students who had entered French immersion programs at different points, in grade 1 and grade 7, respectively. What transpired was that "early immersion students' L2 outcomes were much more likely to be associated with a memory measure than with a measure of language ability, whereas the opposite was the case for the late immersion students" (p. 395). DeKeyser's (in press) replication of the Johnson and Newport (1989) study yielded similar results: the few adult beginners in his study who scored within the range of the child beginners had high levels of verbal analytical ability, an ability which was not a factor in the performance of the child beginners. DeKeyser interprets his results as suggesting that maturational constraint applies only to implicit language learning mechanisms. Harley and Hart, for their part, acknowledge the possible influence of different instructional styles associated with primary versus secondary-level education. A further possibility is that both sets of results are related to general cognitive changes which impact on language learning but not *only* on language learning.

A further feature of recent age-related L2 research has been a revival of interest in explanations of age effects which depart from the classic "critical period" or "sensitive period" view, according to which there is a period of neurological "language readiness" with rigid limits outside of which language acquisition of any kind is difficult. Arguments advanced in favor of the critical period position have referred to neurological changes observable between childhood and adolescence/adulthood, including the kinds of changes that appear to be indicated by the above cited studies by Kim et al (1997) and by Weber-Fox and Neville (1999). Counter arguments have included: (a) that the relevant causality has not been established; (b) that the evidence does not point to the kind of sharp cut-off point that characterizes critical periods; (c) that the attainment of some late beginners to native-like proficiency runs counter to the proposition of fixed maturational constraints; and (d) that other more plausible explanations for age effects are available.

With regard to causality, some researchers (e.g., Bialystok & Hakuta, 1999; Marinova-Todd et al., 2000) argue that no clear relationship has yet been established between neurological differences and differences in language proficiency. Accordingly, it is legitimate to speculate that children and adults may, for example, "localize their learning differently without showing different levels of learning" (Marinova-Todd et al., 2000, p. 17). The same kind of point can be made about the issue of myelination and reduced brain plasticity. Marinova-Todd et al. note in this regard (p. 18) that there is still uncertainty about the precise connection between learning and the state of the neural network. Another possibility, raised by Bialystok and Hakuta (1999), citing Gazzaniga (1992), is that the direction of causation may be the reverse of the one usually assumed; they note that brain differences are as likely to reflect different kinds of experience as to determine these experiences, and that such induced differences cannot simply be assumed to support different levels of performance. Even if neurological differences between younger and older L2 beginners do relate to differences in proficiency levels, there is always the possibility "that the adult learners assessed ... were poorly selected and do not represent highly proficent adult bilinguals" (Marinova-Todd et al., 2000, pp. 17–18).

The existence or nonexistence of a cut-off point such as would normally be associated with a critical period is extensively discussed by Bialystok and Hakuta. Their reanalysis (Bialystok, 1997; Bialystok & Hakuta 1994) of Johnson and Newport's (1989) data (see above) shows "that the tendency for proficiency to decline with age projects well into adulthood and does not mark some defined change in learning potential at around puberty" (Bialystok, 1997, p. 122). More recently, Bialystok and Hakuta (1999) analyzed Census data on age of arrival and reported English proficiency for Chinese-speakers and Spanish-speakers who had resided in New York State for at least 10 years; what emerged is, on the one hand, a steady linear decline of reported English proficiency as age of arrival increased but, on the other, no indication of a dramatically sharper rate of decline at any point between infancy and senescence. Recent data on the relationship between L2 accent and age of arrival obtained by Flege and his colleagues (see, e.g., Flege, 1999) show a similarly continuous decline.

A number of studies have already been cited demonstrating that some adult L2 beginners attain similar levels of proficiency to those attained by child beginners. Such evidence does not sit well with the notion of a neurologically based critical period, which, as Bialystok (1997) says, ought to reveal itself in an unambiguous linkage between L2 proficiency levels and age of first exposure "consistent across studies" (p. 118).

Finally in this section, let us consider some of the alternatives to a neurological account that have been offered to explain the age factor in L2 acquisition. One that has long been and continues to be discussed is strength of motivation. Marinova-Todd et al. (2000) cite Pulvermuller and Schumann's (1994) judgment that motivation, rather than neurology, is the determining factor in SLA success, and point to the fact that some older beginners who achieve native-like proficiency are characterized by very high levels of motivation. They refer to Ioup's subjects (Ioup et al., 1994), but other instances also spring to mind, e.g., the exceptional case mentioned by Moyer (1999).

A particular dimension of the motivation issue relates to the question of language dominance. Older arrivals in an L2 environment may make behavioral choices which bring them into frequent contact with fellow native speakers of their L1 and limit their contact with the L2; such choices may have to do with the avoidance of isolation in the new environment and/or the desire to maintain a particular linguistic and cultural identity. Fewer choices may be available to younger arrivals because of compulsory schooling. In any case, their linguistic and cultural identity is unlikely to be as fully formed as that of their elders, and so the motivation to maintain it may be much weaker. According to research conducted by Jia and Aaronson (1999), what results from these contrasting circumstances is that, whereas immigrants arriving at ages older than 10 tend to maintain their L1, immigrants arriving before age 10 seem to switch their dominant language from the home language to the language of the host country. The implication of this phenomenon is that some studies purportedly focusing on L2 proficiency may, in fact, be reporting on a language which has effectively become an L1 for the subjects in question (cf. Bialystok, 1997, p. 123).

This last point clearly raises issues concerning amounts and patterns of L2 input and use, another major focus for discussion of alternatives to the critical period hypothesis. Much of the recent work by Flege and his colleagues has demonstrated the importance of environmental factors for L2 pronunciation, with time spent in a country where the target language is in use (Riney & Flege, 1998) and time spent in the company of native speakers (Flege, Frieda, & Nozawa, 1997) emerging as major determinants of quality of L2 accent. Like Jia and Aaronson (1999), Flege sees a trade-off between L2 and L1 proficiency. He takes an "interactionist" line according to which "bilinguals are unable to fully separate the

L1 and the L2 phonetic system" so that "the phonic elements of the L1 subsystem necessarily influence phonic elements in the L2 system, and vice versa" (1999, p. 106). According to this view, young children may acquire a good L2 accent at the expense of their L1 accent; or, alternatively, they may develop an authentic accent in their L1 at the cost of not being able to develop a native accent in their L2. Flege's suggestion is that, as L1 phonology continues to be refined, its influence on L2 phonological acquisition continuously increases.

Another dimension of the input explanation is the role of instruction. Bialystok (1997, p. 123) points out that immigrants who arrive as children enter the education system at a point where explicit language instruction is part of the normal régime for all pupils, whereas the kind of education available to immigrants arriving in early adulthood is unlikely to include language training. With regard to the successful late acquisition of an L2 accent, Bongaerts (1999) comments that his subjects "had all received intensive perceptual training that focused their attention on subtle phonetic contrasts between the speech sounds of the target language and those of their L1" (pp. 154–155), and that this may well have been a factor in their success.

A further proposal is that age-related differences in L2 proficiency are explicable in terms of general cognitive considerations. Thus, Bialystok and Hakuta (1999) suggest that the presence or absence of literacy skills in the L2 may have a bearing on L2 proficiency and note that immigrants who arrive young are likely to have such skills in good measure because of experience at school, while those who arrive at an older age may not. Bialystok and Hakuta also point to a deterioration over the lifespan in such areas as capacity to perform tasks under time pressure, risk-taking, establishing long-term memory codes, and ability to recall details. They comment: "if age-related changes in ultimate language proficiency are to be attributable to these cognitive changes . . . then the decline in ultimate proficiency . . . should . . . be gradual and constant" (p. 172). The evidence suggests that this is precisely how it is.

Conclusion

Few L2 researchers challenge the proposition that those L2 acquirers whose exposure to the L2 begins early in life for the most part attain higher levels of proficiency than those whose exposure begins in adolescence or adulthood. The questions that continue to divide the field are: (a) is this a broad tendency or an absolutely inviolate law? and (b) how are such age effects to be explained?

In relation to (a), it may be true, as Hyltenstam and Abrahamsson (2000, p. 155) claim, that there is no case on record of a post-pubertal L2 beginner who has been demonstrated to behave in every last linguistic detail like a native speaker. However, it is also true, as Hyltenstam and Abrahamson acknowledge, that the more closely we study very early L2 beginners, the more we realize that, at the level of subtle detail, they too differ from monoglot native speakers. It seems that, as Grosjean (e.g., 1992) and Cook (e.g., 1995) have been arguing for years, what makes the difference is the very fact of knowledge of another language. Accordingly, the appropriate comparison is not between postpubertal L2 beginners and monoglot native speakers, but between postpubertal L2 beginners and those who begin to acquire an L2 in childhood. Given the trend of recent research findings, it would be a very brave individual who would wager a large sum against the proposition that postpubertal L2 beginners who in all respects perform at levels set by early beginners, even very early beginners, can and will be identified.

Concerning (b), it is difficult to resist quoting yet again Oscar Wilde's wise words about the truth being "rarely pure and never simple." Bialystok (personal communication) takes the view that talking about an age factor is misconceived; we should rather be thinking in terms of a range of age factors. This coincides with my own conclusion of more than a decade ago which I have not discarded: that "the various age-related phenomena . . . probably result from the interaction of a multiplicity of causes" (Singleton, 1989, p. 266). Such a perspective can encompass the notion that decreasing cerebral plasticity and/or other changes in the brain may play a role, but the notion that L2 age effects are exclusively neurologically based, that they are associated with absolute, well-defined chronological limits, and that they are particular to language looks less and less plausible.

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The following recent review articles are well worth consulting.

Birdsong, D. (1999). Introduction: Whys and why nots of the critical period hypothesis for second language acquisition. In D. Birdsong (Ed.), *Second language acquisition and the critical period hypothesis* (pp. 1–22). Mahwah, NJ: Lawrence Erlbaum, Associates.

This overview presents a variety of views on maturational constraints on language acquisition from the perspective of someone whose belief in the critical period was shaken by his own data, followed by some reasons to doubt the critical period hypothesis (notably the above-discussed absence of a sharp cut-off point and the native-like performance of some late beginners).

Harley, B., & Wang, W. (1997). The critical period hypothesis: Where are we now? In A. M. B. de Groot & J. F. Kroll (Eds.), *Tutorials in bilingualism: Psycholinguistic perspectives* (pp. 19–51). London: Lawrence Erlbaum.

This article provides a very wide-ranging review of work on the critical period hypothesis, accepting the hypothesis as a valuable framework for age-related research but emphasizing the complexity and and puzzling nature of relevant findings.

Hyltenstam, K., & Abrahamsson, N. (in press). Maturational constraints in second language acquisition. To appear in C. J. Doughty & M. H. Long (Eds.), *Handbook of second language acquisition*. London: Blackwell.

This chapter expands on the points made in Hyltenstam and Abrahamsson (2000) and attempts to reconcile the evidence pro and contra the notion of maturational constraints in L2 acquisition by positing an interaction between maturational and sociopsychological factors.

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6. APTITUDE FOR LEARNING A FOREIGN LANGUAGE

Richard Sparks and Leonore Ganschow

What has happened with the construct of foreign language aptitude since 1990, at which time symposium participants from around the world agreed that the "...time has come to rethink the notion of what constitutes aptitude to learn foreign languages?" To answer this question, we begin with a review of studies on foreign language aptitude and its measurement prior to 1990. We then describe research and thinking in the 1990s in several areas, including affective variables; language learning strategies; learning styles as contributors to aptitude; and aptitude as a cognitive construct affected by language variables. Next, we review research on individual differences in language learners and the importance of phonological/orthographic processing for foreign language learning. Finally, we suggest new directions for research in foreign language aptitude.

In 1990, 65 international experts on foreign language (FL) instruction from across the world reached agreement that "...the time has come to rethink the whole notion of what constitutes 'aptitude' to learn FL's" (Parry & Stansfield, 1990, p. 2). In this chapter, we first review studies up to 1990 and then describe research and thinking in the 1990s. In particular, we pay attention to topics such as FL aptitude tests, affective variables as contributors to aptitude, language learning strategies as contributors to aptitude, and the linguistic coding differences hypothesis (LCDH) as a plausible construct for the study of FL aptitude. In the last section, "FL Aptitude Reconsidered," we summarize our findings on recent changes in thinking on FL aptitude and suggest directions for future research.

FL Aptitude Up to 1990

Foreign language (FL) aptitude has been of interest to FL researchers in the U.S. since the 1920s. Spolsky (1995) reports that the initial interest in language aptitude came from colleges and universities. However, the major developments in FL aptitude testing in the 1960s were the results of initiatives by the government.

The first attempts to develop FL aptitude tests occurred in the late 1920s and 1930s when language specialists constructed "prognosis" tests. These tests were developed to determine both how well one might perform in FL learning situations and also who might not benefit from FL instruction. Stoddard and Vander Beke's (1925) test included subtests involving English grammar and Esperanto words. A group at George Washington University developed a test that involved learning elements of an artificial language (Hunt et al., 1929). Luria and Orleans (1928) developed a test that included vocabulary exercises and grammar translations in Spanish and French. Symonds (1930a, b), who also developed a test for FL prognosis, suggested that three types of aptitude were important: ability in the student's native language, general intelligence, and "quick learning" tests in the new language. His test was useful for predicting performance in French high school classes (e.g., see Michel, 1934, 1936). However, Kaulfers (1931) reported that IQ scores or English grades were better predictors of FL performance than were the prognosis tests. He suggested that prognosis tests were actually weighted intelligence tests. Kaulfers (1939) also suggested that the effectiveness of aptitude tests for FL learning was dependent on the instructional situation.

During World War II, admission to intensive language training courses in the military was based primarily on previous education (Spolsky, 1995). As language training increased in the military, the U.S. Army funded a study of FL aptitude led by Dorcus, et al. (1953) at UCLA. The group developed a paper and pencil test measuring ten "major aptitude skills." However, the results of the project were disappointing and did not improve upon the predictive power of earlier prognosis tests.

In the 1960s, John Carroll conducted studies on FL aptitude and based his investigation on two propositions: facility to learn to speak a FL is a specialized talent, or group of talents, independent of intelligence; and strong FL aptitude is rare in the general population (1962). He noted that general intelligence tests had been relatively unsuccessful in screening individuals who were successful in language training. Through factor analytic studies, Carroll found that four independent variables proved most relevant to FL learning: (a) phonetic coding, or the ability to code and remember auditory phonetic material over time; (b) grammatical sensitivity, or the ability to handle grammar; (c) inductive language learning ability, or the ability to infer linguistic forms, rules, and patterns from new linguistic content; and (d) rote memory, or the capacity to learn phonetic and grammatical associations (Carroll, 1962, 1981, 1985). Based on his model of FL aptitude Carroll, in conjunction with Stanley Sapon, published the *Modern Language Aptitude Test* (*MLAT*) (Carroll & Sapon, 1959). The *MLAT* measures FL aptitude using a simulated format (i.e., a "fake" FL) and English grammar to provide an indication of one's probable degree of success in learning a FL. In the

1960s, Paul Pimsleur also developed a measure of FL aptitude, the *Language Aptitude Battery* (*LAB*) (Pimsleur, 1966). The *LAB* consists of a Verbal Ability score (tests of Vocabulary and Language Analysis) and an Auditory Ability score (tests of Sound Discrimination and Sound-Symbol Association). A FL aptitude measure similar to the *MLAT*, the *Defense Language Aptitude Battery* (*DLAB*) (Petersen & Al-Haik, 1976), is used by the Defense Language Institute (see Lett & O'Mara, 1990).

Carroll (1963, 1973) also hypothesized a model of FL school learning that incorporated the variables in the *MLAT* found to be predictive of successful FL learning. The Carroll Model of School Learning includes two primary components: *instruction* and *individual learning differences*. The instruction component is influenced by: (a) time devoted to FL study; and (b) quality of instruction. The individual differences component comprises the following: (a) general intelligence, or ability to profit from general instruction; (b) language aptitude, or the skills assessed by the *MLAT*; and (c) motivation to study and learn the FL. Drawing upon Carroll's model, Wesche (1981) and Skehan (1986a) noted that more successful FL learning occurred when findings from FL aptitude tests (e.g., language strengths and weaknesses, individual differences) corresponded with teaching methods.[1] Skehan (1986b) concluded that Carroll's model is applicable to both formal (i.e., school learning) and informal (e.g., immersion) language learning situations.

According to Spolsky (1995), Carroll's work in FL aptitude and the development of the *MLAT* added three "vitally important dimensions" to the study of FL aptitude. First, Carroll developed a test that "measured, as well as anything can, some of the components of individual variation in ability to learn to speak" a FL (p. 338). Second, Carroll developed a "model of FL aptitude that showed how measurable abilities interact with goals and methods" (p. 338). Third, his model "made the whole issue [of FL aptitude] clearer, by showing that aptitude was only one of the factors involved" (p. 338) in a general theory of FL learning.

In the late 1960s and 1970s, FL educators began to focus on the role that affective variables might play in successful FL learning. Gardner (1990) defines affective variables as "... those motivational or predispositional characteristics of individuals that influence their perceptions and impressions of the language learning context" (p. 179). Examples of frequently investigated affective variables are attitude and motivation (Gardner, 1985; Gardner & Lambert, 1972), anxiety (Horwitz, Horwitz, & Cope, 1986), and personality (Brown, 1973; Ehrman, 1990).

In the 1970s and 1980s, Gardner and his colleagues conducted studies to analyze the effects of attitude and motivation on FL learning. Their studies showed that high motivation and positive attitudes correlated positively with strong FL achievement. (See Gardner, 1990, for a related review.) They suggested that attitudes and motivation are relatively independent of FL aptitude and speculated further that attitude and motivation are comprised of three components: (a) motivation to learn the FL; (b) desired affiliation with the target language community; and (c) attitude toward the learning situation.

Others have speculated that high levels of anxiety can negatively affect the learning of a FL. Scovel (1978) reviewed studies on FL learning and anxiety and concluded that the relationship between the two was unclear. Horwitz, Horwitz, and Cope (1986) hypothesized that there is an anxiety specific to FL learning and developed a self-report measure, the Foreign Language Classroom Anxiety Scale, to measure the construct (see Horwitz, this volume). Gardner (1990) reviewed studies on anxiety and suggested that measures of anxiety involving the learning of a FL correlate negatively with measures of FL achievement (i.e., as FL achievement increases, anxiety decreases).[2]

Ehrman hypothesized that personality type is important for FL learning and used the *Myers-Briggs Type Indicator* (*MBTI*) in studies to determine its applicability (Ehrman & Oxford, 1989; Oxford & Ehrman, 1989). Qualitative findings of her research suggest that personality measures provide useful information about the compatibility of individual student's learning types with teaching styles and teaching methods; however, studies showed that personality instruments were not good predictors of FL learning success (Ehrman, 1990).

Some researchers have questioned the role of affective variables as a primary causal factor in FL learning. Oller (1981) speculated that the self-report instruments used to measure affective states may unintentionally be measuring language proficiency. Au (1988) criticized Gardner's theory on attitudes and motivation for its failure to establish a causal link between motivation and FL learning. Sparks and Ganschow criticized self-report instruments of FL anxiety because most of the items are also measuring receptive language, expressive language and verbal memory skills (Sparks & Ganschow, 1991), or reading skills (Sparks, Ganschow, & Javorsky, 2000).

In the 1980s, FL educators speculated that inefficient use of language learning strategies and a learner's cognitive style affected FL learning. Oxford (1990) detailed six categories of language learning strategies: metacognitive, cognitive, compensation, memory, affective, and social. She and other learning strategy researchers found that good language learners use more efficient strategies than poor FL learners and suggested that poor FL learners can be trained to use strategies to improve their learning (see, e.g., O'Malley & Chamot, 1990; Oxford & Crookall, 1989). Oxford acknowledged that there is a lack of consensus among researchers about how to measure and use the aforementioned categories of learning strategies.

Some researchers have expressed caution about the role of cognitive style and learning strategies in FL learning. Tiedeman (1989) reviewed cognitive styles research and found that most measures of cognitive style are best interpreted as tests of ability, not as measures of preferences for information processing. Sparks and Ganschow (1993a) suggested that linking inefficient use of language learning strategies to poor FL learning is problematic because it implies that students with FL learning problems are likely to be deficient in dealing with language tasks generally. Sparks (1995) reported that neither cognitive style nor learning strategies have been shown to be related specifically to the learning of language. Skehan (1991) reported that there is little or no evidence to suggest that strategies or style training improve FL learning.

Some researchers have suggested that native language (L1) skills impact upon FL learning (L2). Carroll (1973) hypothesized that FL aptitude is a residue of native (first) language learning. In a study of first language learning, Wells (1985) reported that there were wide individual differences in the speed at which individuals acquired their native language. In a follow-up investigation, Skehan (1986a) examined the relationship between language acquisition, language aptitude, and second language learning by administering measures of FL aptitude to the students from Wells' 1985 study who were now in secondary school. Results showed that their native language ability correlated highly with their skill in learning a FL. Findings also showed that FL aptitude tests (such as the *MLAT*) were good predictors of FL learning skill. Skehan suggested that aptitude tests were good predictors of FL learning because they: (a) tap relevant linguistic skills and knowledge; and (b) draw on skills in using decontextualized language.

Skehan (1986b) also supported Carroll's Model of School Learning. He argued that other approaches to language learning and language aptitude devoted "insufficient attention to individual differences between learners, in terms of their language aptitude, motivation, cognitive style, or learning strategies, emphasizing instead the common features of instructional conditions" (p. 188). He speculated that Carroll's model did not have an impact on other models of FL learning because of: (a) the appeal of newer models of acquisition-oriented (i.e., communicative) approaches to FL learning; (b) the model's "perceived irrelevance" for informal FL learning contexts; and (c) its perceived alliance with "unfashionable" approaches to FL instruction (e.g., direct instruction in the rule systems of the FL). He concluded that Carroll's model was still the "most viable framework" for studying individual differences in FL learning (Skehan, 1986b, p. 217).

FL Aptitude in the 1990s

Much of FL research in the 1990s to the present has focused on the concept of "individual differences" (Ehrman & Oxford, 1995). Two themes govern research and thinking about individual differences in relation to FL aptitude: (a) the continuation of consideration of aptitude as affected primarily by affective variables; and (b) the (re)consideration of aptitude as a cognitive construct, affected to a large extent by language variables, in particular, the individual's facility with language and his/her skill with the phonological/

orthographic rule system of language. An assumption regarding the first theme is that FL learners can modify some personality factors, such as motivation to learn the FL and/or anxiety about learning a FL, through external strategies devised by the student or instructor. Another assumption of the first theme is that FL teachers can improve FL students' learning through instruction in language learning strategies or by matching instruction in the FL with students' learning styles. An assumption regarding the second theme is that FL learners have innate differences in basic language abilities and that there are limitations in the extent to which specialized instruction in the FL will result in enhancing FL aptitude and FL learning. Here, we describe research on aptitude as it relates to each of these two themes.

Individual Differences: Personality Variables

Learning styles and strategies. A considerable body of research in the 1990s has continued to address styles of thinking and their influence on FL aptitude (Barnwell, 1992). Sternberg (1995) defined style as a "...way of thinking...not an ability, but rather how we use the abilities we have." Oxford and Ehrman (1993) used the term "language learning styles" to describe the approaches students "...are predominantly disposed to use in order to learn a new language" (p. 69). The instruments used to identify learning styles are primarily self-report measures and include inventories such as the National Association of Secondary Schools Principals' *Learning Style Profile* (*LSP*) (Keefe, et al., 1989), the *Myers-Briggs Type Indicator* (*MBTI*) (Myers & McCaulley, 1985), the *Type Differentiation Indicator* (*TDI*) (Saunders, 1989), and the *Strategy Inventory for Language Learning* (*SILL*) (Oxford, 1989). In general, research findings show positive but modestly significant correlations between these instruments and FL proficiency. (See Ehrman, 1996, for a summary of other studies related to language learning strategies.)

Anxiety. Of primary interest in research on anxiety and its relationship to FL achievement has been the question of the role anxiety plays in predicting achievement in FL classes (MacIntyre & Charos, 1996). Most studies have continued to use Horwitz's FL anxiety scale (Horwitz, Horwitz, & Cope, 1986). Gardner & MacIntyre (1993) reported that language anxiety is the best single correlate of FL achievement. Sparks and his colleagues (Sparks, Ganschow, Artzer, Siebenhar, & Plageman, 1997) found differences in anxiety between good and poor FL learners on end-of-year high school oral and written proficiency measures. Onwuegbuzie, Bailey, and Daley (1999) reported that several aspects of students' self-perception were predictors of FL anxiety: their expectation of overall achievement in FL courses, their perceived self-worth, and their perceived scholastic competence (p. 228).

A new question raised in the 1990s was whether anxiety is a cause or a consequence of FL achievement (Ganschow & Sparks, 1996; Sparks & Ganschow, 1991). Findings suggest that, to date, researchers have not factored out the role of basic language ability in studies involving FL anxiety (Ganschow & Sparks, 1996). Ganschow et al. (1994), for example, found that a large number of college FL learners reported having high anxiety (on the Horwitz anxiety scale); however, some indicated learning a FL was easy and others reported that it was quite difficult. The authors inferred that those students who reported having high anxiety and found learning a language very difficult may have had broad basic language learning difficulties. Some researchers have reported that FL anxiety interferes with language learning because it reduces the ability to concentrate on the target language and is likely to impede memory efficiency (MacIntyre & Gardner, 1991, 1994).

Motivation. Motivation and its effect on FL proficiency also has continued to generate much discussion in the 1990s. Gardner and Tremblay (1994) outlined how the *Attitude Motivation Test Battery* (Gardner, 1985) might be used to facilitate investigations on the role of motivation in FL learning. Tremblay and Gardner (1995) suggested that there might also be new indices of motivation such as goal specificity, persistence, and attention that are causally related to each other and also to measures of achievement in French. In their study, they found significant relationships among motivational constructs and FL achievement.

Individual Differences: Cognitive Aptitude Factors

FL aptitude. In 1990, John Carroll wrote the opening chapter of the Conference Proceedings on "Aptitude Reconsidered." Here he again clarified the importance of cognitive abilities in FL aptitude and suggested that his test of FL aptitude, the *MLAT*, would likely continue to provide a good predictor of aptitude for learning a FL.[3] As noted earlier, this test measures an individual's facility with several aspects of the rule systems of language in a nonsense language format. Much of the research from the 1990s to the present has supported Carroll's claim. Studies on high school and college FL learners by Sparks, Ganschow, and colleagues have consistently shown that the *MLAT* is an important predictor of FL achievement after one and two years of study (Sparks, Ganschow, & Patton, 1995; Sparks, Ganschow, Patton, Artzer, et al., 1997). Several studies showed that good FL learners have significantly stronger FL aptitude on the *MLAT* than poor FL learners (Ganschow, Sparks, Javorsky, Pohlman, & Bishop-Marbury, 1991; Ganschow et al., 1994; Sparks & Ganschow, 1996; Sparks, Ganschow, Javorsky, Pohlman, & Patton, 1992a, b; Sparks, Ganschow, Fluharty, & Little, 1996). Other studies have shown that students who score higher on the *MLAT* achieve higher levels of oral and written FL proficiency after two years of FL study than students who obtain lower *MLAT* scores (Sparks, Ganschow, Artzer, Siebenhar & Plageman, 1998). Studies with adults at the Foreign Service Institute and other government agencies have indicated that the *MLAT* is the best of the available predictors of language learning success (Ehrman, 1998; Ehrman & Oxford, 1995).

In 1998, Child reported on a FL aptitude test he developed, the *VORD* (which means "word" in the artificial language he developed for the test). Using this test, Child and his colleagues identified "adult subjects with a talent for acquiring languages that are markedly different syntactically" from English (Parry & Child, 1990, pp. 30–31). In a study that involved use of the *VORD* and *MLAT* with adults enrolled in government intensive language training programs, the *MLAT* still proved to be the best overall instrument for predicting language learning success. It was unclear, however, whether or not the two aptitude tests differed in their predictive value for non-Indo-European languages. More recently, Child (1998) suggested that *VORD* may be particularly useful in "predicting higher level language ability (above Interagency Language Roundtable Level 2) and for indicating whether "channel of communication (i.e., through the eye or the ear) makes an essential difference" (p. 5). He concluded that more research on the *VORD* is needed.

In the 1990s then, much of the research on cognitive aptitude factors aimed at substantiating and extending recognition of the central role in FL learning played by individual differences in basic language aptitude. The following discussion addresses this theme.

Linguistic Coding Differences Hypothesis (LCDH). In the early 1990s, Sparks and Ganschow introduced the LCDH into the FL literature (Sparks & Ganschow, 1991). The LCDH derives from native language research in reading conducted by Vellutino and Scanlon (1986), who found that poor readers have problems with the phonological/orthographic (sound and sound/symbol) and syntactic (grammatical) but not the semantic (meaning) components of language. In the LCDH Sparks and Ganschow speculated that: (a) native language skills serve as the foundation for learning a FL; (b) difficulties with one component of language (e.g., phonology/orthography) are likely to have a negative effect on both native and FL learning; and (c) there are innate individual differences in students' ability to use language.

During the past ten years, Sparks, Ganschow, and colleagues have conducted a series of studies to test the efficacy of the LCDH. Several studies have compared good and poor FL learners in high school and college (Ganschow et al., 1991, 1994; Sparks et al., 1992a,b, 1996; Sparks, Ganschow, Artzer, Siebenhar, & Plageman, 1997, 1998). In brief, findings showed: (a) successful FL learners exhibited significantly stronger native language skills than unsuccessful FL learners on measures of phonological/orthographic and syntactic skills, but not on semantic tasks; (b) successful FL learners exhibited significantly stronger FL aptitude on the *MLAT*; and (c) students with stronger native language skills and higher FL aptitude achieved higher levels of proficiency in the FL after two years of FL study. The authors also conducted factor analytic studies that supported the tenets of the LCDH (see, e.g., Ganschow, Sparks, Patton, & Javorsky, 1992; Sparks, Ganschow, & Patton, 1995; Sparks, Javorsky, Patton, & Ganschow, 1998). Studies by other researchers have provided support for the basic premise of the LCDH, i.e., that native language skills are important for learning a FL (see Dufva

& Voeten, 1999: Humes-Bartlo, 1989; Olshtain, Shohamy, Kemp, & Chatow, 1990; Papagno, Valentine, & Baddeley, 1991).[4]

Phonological/othographic processing and cross-linguistic transfer. In a review, Koda (1996) reported that FL word recognition (i.e., decoding) is a relatively unexplored area in FL research. This finding is surprising given the longstanding emphasis on aspects of word recognition in native language reading. In native language research, phonological processing skills, in particular, phonemic awareness, (e.g., knowing that spoken words are composed of speech sounds, the ability to segment sounds in spoken words), are among the best predictors of reading acquisition (see reviews by Gough, Ehri, & Treiman, 1992, and Stanovich, 1998). The relationship between reading difficulties and poor phonological processing is also apparent in other languages, such as Danish, French, Greek, Hebrew, Italian, Portuguese, Spanish, Turkish, and Swedish. (For related references, see, Geva, Wade-Woolley, & Shany, 1997; Sparks, Ganschow, & Javorsky, 2000). Even in nonalphabetic languages (e.g., Chinese), research has shown that phonological processing skills are important for learning to read words Hu & Catts, 1993; Leong, Cheng, & Lam, 2000; Suk-Han-Ho & Bryant, 1997. Findings indicate that the development of word decoding and reading comprehension is similar in first and second languages (Geva, 2000; Geva & Wang, this volume) and that FL word recognition plays a significant role in reading comprehension (Koda, 1992, 1996).

Several studies, our own and others, support the importance of the phonological code for successful FL learning. For example, three separate factor analytic studies that we conducted showed a separable phonological factor that contributed significantly to the variance in FL learning (Ganschow, Sparks, Patton, & Javorsky, 1992; Sparks, Ganschow, & Patton, 1995; Sparks, Javorsky, Patton, & Ganschow, 1998). In another study, we found that word recognition in the FL was one of the best predictors of FL proficiency among secondary FL learners (Sparks, Ganschow, Patton et al., 1997). Other researchers have recently supported this finding across several alphabetic languages and among younger learners. In a study with Finnish children, Service (1992) found that phonological/orthographic tests (pseudoword repetition and writing) combined with the ability to comprehend syntactic-semantic structures predicted English learning. In two studies, Cheung (1996) and Service and Kohonen (1995) found that phonological memory (pseudoword repetition) was important for learning FL vocabulary. In a study with Finnish children learning English, word recognition was the best predictor of English proficiency (Dufva & Voeten, 1999). Durgungoglu, Nagy, and Hancin-Bhatt (1993) found that native language word recognition and phonological awareness were good predictors of word recognition skill in Spanish. Crombie (1997) reported similar findings for Scottish children learning French.

Further support for the importance of phonology/orthography in FL learning comes from studies on the effects of specific training in the sound system of the foreign language and its application to the orthography of the language. For example, in several studies with at-risk high school learners, Sparks, Ganschow, and colleagues reported that direct teaching of the sound/symbol system of Spanish resulted in improvement in both FL aptitude as measured by the *MLAT* and native language performance on sound-symbol tasks (Ganschow & Sparks, 1995; Sparks, Ganschow, Pohlman et al., 1992; Sparks & Ganschow, 1993b; Sparks, Ganschow, Artzer, & Patton 1997; Sparks, Artzer, Patton, et al., 1998). These studies, too, have their basis in native language research, which shows improvement in the literacy skills of learners who receive direct training in the phonological/orthographic rule system (Bradley & Bryant, 1983; Byrne & Fielding-Barnsley, 1991; Compton, 2000; Lundberg, Frost, & Peterson, 1988).

Another area providing new research directions on FL aptitude in the 1990s is the reemergence and extension of thinking about cross-linguistic transfer, again in relation to the role of the phonological/orthographic system. Findings suggest that phonological awareness transfers across alphabetic languages and that it may be a general, rather than language-specific, cognitive mechanism (Cisero & Royer, 1995). Most studies have been conducted with young beginning-level readers/spellers. For example, Durgunoglu et al. (1993) found that Spanish phonological awareness and Spanish word recognition predicted children's performance on English word and pseudoword recognition tests. Comeau and colleagues (Comeau, Cormier, Grandmaison, & LaCroix, 1999) reported similar findings for English-speaking children learning French in an immersion setting. Service (1992) reported that pseudoword repetition was a good predictor of learning English as a FL among a group of Finnish children. Holm and Dodd (1996) reported findings on ESL students showing that students from non-alphabetic written language backgrounds had more limited phonological awareness when compared to students with alphabetic first language literacy. Cheung (1996) reported on the importance of phonological short-term memory in long-term learning of FL/second language vocabulary (see also, Papagno, Valentine, & Baddeley, 1991). In a recent study with Hebrew-speaking children learning to read English in the fourth grade, Kahn-Horwitz (2000) found that phonological awareness and orthographic skill in Hebrew predicted skill in learning to read English; moreover, there were significant differences in phonological, orthographic, morphological, and word recognition skills in both Hebrew and English among the strong and weak fourth graders. All of these studies provided support for the position that first-language learning and experience with the phonology/orthography of the language affect reading, vocabulary development, and other aspects of FL/second language learning.

In sum, the following developments shaped FL aptitude research in the1990s and have helped to prepare the way for new thinking about FL aptitude:

1. Reemphasis on the *MLAT* as a valuable predictor of FL aptitude;
2. Consideration of possible confounding of affective variables and language factors in prediction studies;

3. Research on native language predictors of FL achievement;
4. Reference to bottom-up models of reading processes in English as they relate to aptitude for learning a foreign/second language; and
5. Emergence of studies on cross-linguistic transfer of phonological skills across language systems and their potential role in relation to research on language aptitude.

FL Aptitude Reconsidered

What, then, lies ahead for those interested in further exploration of FL aptitude? We make several suggestions here:

- *Develop or use existing phonological measures in one's native and/or foreign language for prediction of FL aptitude.* Aptitude tests using phonological measures might include tasks such as word recognition, pseudoword decoding, phonological memory, and phonemic awareness. Evidence primarily from native language research in the 1990s indicates that these variables may be potential indicators of FL aptitude as well.

- *Establish new norms for the MLAT.* In the 1990s the *MLAT* was reported to be one of the best predictors of FL aptitude in the field. Yet FL educators seldom use the instrument, except in occasional research studies and in specialized settings such as government agencies. Use of the *MLAT* as a current predictor is problematic because of its outdated norms (1959) and because the test is no longer being published. A challenge for the future is to update the instrument by developing new norms. Another challenge is developing norms for younger age levels. Researchers might consider renorming the elementary form of the *MLAT* (Carroll & Sapon, 1967).

- *Clarify the role of personality variables in FL aptitude.* To date, researchers have not clarified the issue of attitude/motivation/anxiety (or the role of personality variables) in learning a FL because no one has determined the role of basic language aptitude in the FL learning of, for example, students with high anxiety about learning a FL. A challenge for the future is for researchers to include measures of native language and/or FL proficiency in their studies on affective variables.

There are several additional areas for possible exploration that researchers have not addressed sufficiently, or at all, to date. They include:

1. Clarifying the relationship between literacy and oral proficiency in a FL. For example, are there different kinds of FL aptitude, depending on the task?
2. Examining similarities and differences between languages, especially the transfer from morphosyllabic languages, such as Chinese, to alphabetic languages (and vice versa) and their impact

on FL aptitude. For example, would an individual whose native language is Chinese have more difficulty learning an alphabetic language such as English than s/he would have learning another morphosyllabic language?

3. Reassessing Carroll's Model of School Learning (1962, 1973) and testing the efficacy of the model. For example, does type of instruction make a difference in FL proficiency? Would more time spent on FL learning allow students with FL learning problems to achieve a certain level of FL proficiency or permit average students to become more proficient FL learners?

Future research that provides data relevant to these questions will promote more precise understanding of FL aptitude and its many possible influences on learner success.

Notes

1. Based on the results of FL aptitude tests, both Wesche and Skehan found three different groups of FL learners who exhibited the following characteristics: (a) strengths in analyzing language; (b) strengths in learning large amounts of material through memory; and (c) a balance of skills in analyzing language and memory.

2. In a recent study, Saito, Horwitz, and Garza (1999) suggested that there is also a specific anxiety when learning to read a FL. However, Sparks, Ganschow, and Javorsky (2000) questioned this hypothesis because: (a) the items on Saito et al.'s reading anxiety instrument are related to students' word decoding and language comprehension skills; (b) research in native language reading has demonstrated conclusively that difficulties in learning to read are due to problems with the cognitive skills necessary for reading (e.g., phonological processing or word decoding); and (c) Saito et al. did not measure the native language or FL reading skill of their participants.

3. Carroll reported that the validity of the *MLAT* and other FL aptitude tests had been "amply demonstrated" (1990, p. 12).

4. Sparks and Ganschow have extended the LCDH to include a concept called the "assumption of specificity" (AOS). The premise of the AOS concept is that students with a particular learning problem have a cognitive deficit (or difference) that is reasonably specific to the task at hand (Hall & Humphreys, 1982; Stanovich, 1988). With FL learning problems, the cognitive difference is likely to be language-related because FL learning is a language-related task. (See Sparks & Ganschow, 1993a, 1995a for a more detailed description of the AOS.) Sparks and Ganschow also suggest that researchers trying to determine the underlying cognitive factors related to poor FL learning should first specify the particular learner differences to be studied. Thus, participants in research studies should display similar performance differences in order to combat heterogeneity in

research studies (Sparks, Ganschow, & Javorsky, 1995; Sparks, Javorsky, & Ganschow, 1995).

ANNOTATED BIBLIOGRAPHY

Dufva, M., & Voeten, M. (1999). Native language literacy and phonological memory as prerequisites for learning English as a foreign language. *Applied Psycholinguistics, 20*, 329–348.

This article provides empirical support for the premises of the Linguistic Coding Differences Hypothesis for English as a FL and demonstrates the importance of native language literacy for FL learning. The authors examined the effects of phonological memory and native language literacy on learning English as a FL by following the performance of 160 Finnish children from first through third grades. Using structural equation modeling, they examined the influence of phonological memory and native language literacy on FL learning. The authors found that the strongest predictor of English proficiency was second grade word recognition skill. Together, word recognition with reading comprehension and phonological memory explained 58% of the variance in later English language proficiency (p. 341). They concluded that native language word recognition forms the basis for learning a FL, even though orthographies may differ, as they do between Finnish and English. The authors also suggested that the faster the child's speed of word recognition, the better he/she would perform in English and that native language comprehension may become more important as FL skills develop. They recommend that educators attempt to identify children with native language decoding difficulties early in order to provide intensive literacy instruction, which may in turn enhance learning a FL.

Durgunoglu, Y., Nagy, W., & Hancin-Bhatt, B. (1993). Cross-language transfer of phonological awareness. *Journal of Educational Psychology, 85*, 453–465.

This article is one of the few empirical studies that uses research findings on first language reading research to demonstrate the importance of word recognition in higher level processing skills, such as reading comprehension. The authors raise the question of whether skills from the first language transfer to second language reading, i.e., cross-language transfer. They examined variables affecting the English word recognition skills of 31 Spanish-speaking bilingual beginning readers. The results indicated that both phonological awareness and word recognition skills in Spanish were predictors of word recognition in English (p. 463) and that oral proficiency in English was not a reliable predictor of certain reading abilities such as word recognition.

Muljani, D., Koda, K. & Moates, D. (1998). The development of word recognition in a second language. *Applied Psycholinguistics, 19*, 99-113.

In this article, the authors raise the question of the relationship between first and second language learning and, in particular, the impact of L1 orthography on L2 word recognition. Using a comparison between Indonesian and Chinese adults learning English as a second language, the authors conducted a cross-linguistic experiment using two different types of orthographies to examine L1-L2 orthographic distance and L2 word frequency. Findings showed that familiarity with an alphabetic writing system (Indonesian) helped ESL readers read English words, thus supporting a connectionist word recognition model as a framework for understanding L2 word recognition.

Skehan, P. (1986b). The role of foreign language aptitude in a model of school learning. *Language Testing, 3*, 188-221.

Skehan reexamines Carroll's Model of School Learning, developed in 1962, to explain variables that comprise FL aptitude. Carroll's model has two variables: individual differences and instruction. According to Skehan, both need to be considered. Instruction is influenced by two factors. One is time: the more time one devotes to language study, the higher the level of accomplishment. The second factor is instruction: the better the quality of instruction, the higher the student's level of attainment. The second variable, individual differences, includes general intelligence, aptitude for learning a FL, and motivation. General intelligence relates to the individual's ability to profit from instruction; aptitude is what Carroll and Sapon attempt to measure in the *MLAT*; and motivation has to do with the individual's need to learn the language and his/her willingness to persevere. Skehan emphasizes that Carroll " . . . has always been careful to define aptitude in terms of time required to reach a criterion level, not in terms of some people being unable to learn languages" (p. 192). He presents research supporting the model and argues that the model has explanatory power in both informal (contextualized) and formal (decontextualized) situations. Skehan concludes that educators should reevaluate the relevance of FL aptitude in order to devise "...group instructional procedures for different learners with different strengths and weaknesses in language learning skills" (p. 215). He cautions educators not to emphasize one class of variables over the other, because it is the interaction between the two that comprises aptitude.

Sparks, R. (1995). Examining the Linguistic Coding Differences Hypothesis to explain individual differences in foreign language learning. *Annals of Dyslexia, 45*, 187–219.

This article provides a theoretical underpinning for a viable hypothesis about language aptitude, the Sparks-Ganschow Linguistic Coding Differences Hypothesis (LCDH), and forms the basis for extensive research on FL learning in high school and college. Sparks describes the theory and rationale behind the LCDH in which the authors speculate that FL learning problems are likely to arise from difficulties in native language learning and that phonological (sound)/orthographic (symbol) processing difficulties represent the primary problem for many at-risk FL learners. He reviews research supporting the LCDH and argues that this hypothesis provides the strongest inference among competing theories of FL aptitude that include affective, motivational, and language learning strategies and styles. Sparks uses criteria from psychology, the concept of modularity, and the assumption of specificity to support his position.

Spolsky, B. (1995). Prognostication and language aptitude testing, 1925–1962. *Language Testing, 12*, 321–340.

This article provides an historical review of FL aptitude research. Spolsky presents a social and political perspective on the history of FL aptitude in the U.S. from the 1920s through the early 1960s. Spolsky divided his paper into two parts. Part I is a description of "prognosis" tests in the 1920s, which Spolsky says were developed primarily to "exclude unqualified students from high school FL classes" (p. 321). Research on prognosis established the place of aptitude testing as a central topic in language testing research (p. 328). Spolsky suggests that the main research approach during this time was one of hypothesis testing that helped to clarify problems of testing aptitude for learning a FL. In the second part, Spolsky describes research on aptitude tests to identify appropriate candidates for intensive language training. The first effort, test batteries developed for government language programs, were not successful. In the 1950s, however, John Carroll was successful in developing the Modern Language Aptitude Test to predict oral and written language skills. Spolsky describes Carroll's test and its importance for the understanding of FL aptitude today. He concludes, along with Carroll, that "aptitude is only one of the factors that can be used to predict success in L2 learning" (p. 338).

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7. LANGUAGE ANXIETY AND ACHIEVEMENT

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This chapter considers the literature on language learning anxiety in an effort to clarify the relationship between anxiety and second language learning. It will first argue that language anxiety is a specific anxiety—rather than a trait anxiety—and discuss how this conceptualization has helped clarify the research literature. After Horwitz, Horwitz, and Cope (1986) proposed that a specific anxiety construct which they called Foreign Language Anxiety was responsible for students' uncomfortable experiences in language classes and offered an instrument, the Foreign Language Classroom Anxiety Scale (FLCAS), to measure this anxiety, findings concerning anxiety and language achievement have been relatively uniform, indicating a consistent moderate negative relationship between anxiety and achievement. However, some researchers (Sparks and Ganschow and their colleagues) have suggested that poor language learning is a cause rather than a result of language anxiety. This review concludes that anxiety is indeed a cause of poor language learning in some individuals and discusses possible sources of this anxiety, including difficulty in authentic self-presentation and various language teaching practices. In addition, it reports on new trends in language anxiety research that attempt to identify aspects of language learning (e.g., reading anxiety or writing anxiety) which provoke anxiety for some individuals.

Researchers, language teachers, and even language learners themselves have been interested in the possibility that anxiety inhibits language learning for quite some time. Clinical experience, empirical findings, and personal reports all attest to the existence of anxiety reactions with respect to language learning in some individuals; however, the research history in this area has not been straightforward. This chapter considers the literature on language learning anxiety in an effort to clarify the relationship between anxiety and achievement in second language learning.

Anxiety as Psychological Construct

"Anxiety is the subjective feeling of tension, apprehension, nervousness, and worry associated with an arousal of the autonomic nervous system," (Spielberger, 1983, p. 1). Not only is it intuitive to many people that anxiety negatively influences language learning, it is logical because anxiety has been found to interfere with many types of learning and has been one of the most highly examined variables in all of psychology and education. Psychologists distinguish several categories of anxiety. Typically, anxiety as a personality "trait" is differentiated from a transient anxiety "state." In other words, trait anxiety is conceptualized as a relatively stable personality characteristic while state anxiety is seen as a response to a particular anxiety-provoking stimulus such as an important test (Spielberger, 1983). More recently the term situation-specific anxiety has been used to emphasize the persistent and multi-faceted nature of some anxieties (MacIntyre & Gardner, 1991a). Public speaking anxiety is generally viewed to be in this category, and this chapter will take the position that foreign language anxiety is as well.

Early Perspectives on Anxiety and Language Learning

Since the mid 1960s scholars have entertained the possibility that anxiety interferes with second language learning and performance; however, documentation of that relationship came much later. Interestingly, the relationship between anxiety and second language achievement—the subject of this review—is exactly the same issue that puzzled Scovel over two decades ago (Scovel, 1978). Scovel reviewed the then available literature on anxiety and language learning in an attempt to explain a truly conflicting set of findings. At the time there were studies which found the anticipated negative relationship between anxiety and second language achievement, but several studies found no relationship, and positive relationships between anxiety and second language achievement were also identified (Chastain, 1975; Kleinmann, 1977). In other words, contrary to the predictions of many language teachers, some studies found that learners with higher levels of anxiety actually showed higher achievement scores. Scovel posited a rational solution to this enigma. He argued that since the various studies used different anxiety measures such as test-anxiety, facilitating-debilitating anxiety, etc., they logically found different types of relationships between anxiety and language achievement. Scovel concluded that language researchers should be specific about the type of anxiety they are measuring and recommended that anxiety studies take note of the myriad of types of anxiety that had been identified.

Language Anxiety

Scovel's suggestions have proven to be good ones, and since that time researchers have been careful to specify the type of anxiety they are measuring. However, in 1986, Horwitz, Horwitz, and Cope took the literature a step further by proposing that a situation-specific anxiety construct which they called Foreign Language Anxiety was responsible for students' negative emotional reactions to language learning. According to Horwitz, Horwitz, and Cope, this anxiety stems from the inherent inauthenticity associated with immature second language communicative abilities:

> Adults typically perceive themselves as reasonably intelligent, socially-adept individuals, sensitive to different socio-cultural mores. These assumptions are rarely challenged when communicating in a native language as it is not usually difficult to understand others or to make oneself understood. However, the situation when learning a foreign language stands in marked contrast. As an individual's communication attempts will be evaluated according to uncertain or even unknown linguistic and socio-cultural standards, second language communication entails risk-taking and is necessarily problematic. Because complex and nonspontaneous mental operations are required in order to communicate at all, any performance in the L2 is likely to challenge an individual's self-concept as a competent communicator and lead to reticence, self-consciousness, fear, or even panic (p. 128).

They also offered an instrument, the Foreign Language Classroom Anxiety Scale (FLCAS), to measure this anxiety. Since that time, findings concerning anxiety and language achievement have been relatively uniform. Studies using the FLCAS and other specific measures of second language anxiety have found a consistent moderate negative correlation between the FLCAS and measures of second language achievement (typically final grades). Accordingly, this review will be limited to those studies which assume a specific anxiety reaction to language learning. In addition to the FLCAS, these measures include the French Class Anxiety Scale (Gardner & Smythe, 1975), The English Use Anxiety Scale (Clément, Gardner, & Smythe, 1977), the English Test Anxiety Scale (Clément, Gardner, & Smythe, 1980), the French Use Anxiety Scale (Gardner, Smythe, & Clément, 1979), and the Spanish Use Anxiety Scale (Muchnick & Wolfe, 1982).

The situation-specific anxiety in response to language learning proposed by Horwitz, Horwitz, and Cope has been found to be largely independent of other types of anxiety. Horwitz (1986) found a low but significant correlation between the FLCAS and Spielberger's (1983) test of trait-anxiety ($r = .29, p = .002$). Slight positive, but nonsignificant, correlations were also found between the FLCAS and Fear of Negative Evaluation (Watson & Friend, 1969) and Communication Apprehension (McCroskey, 1970). In the case of test anxiety (Sarason, 1978), the correlation was moderate and significant ($r = .53, p = .001$).

Even so, this correlation means that the two measures only share 28% of variance and are, therefore, reasonably independent. Also consistent with the construct of a situation-specific anxiety, MacIntyre and Gardner (1989) did not find a relationship between general anxiety and foreign language vocabulary learning.

Thus, with the development of distinct situation-specific measures of foreign language anxiety, the issue of appropriate anxiety measurement seemed to be resolved; however, the issue of appropriate outcome measures remained. Steinberg and Horwitz (1986) argued that the use of final grades as a measure of second language achievement was probably in and of itself a source of variability in the anxiety literature and urged researchers to use more subtle achievement measures to capture the true effects of anxiety. Indeed, this study found that ESL students attempted a greater number of elaborated and personal messages in English when experiencing an experimental condition intended to relax them than those learners experiencing a treatment designed to induce anxiety. Importantly, these differences in elaboration and number of personal utterances were observed even though the anxious and nonanxious students displayed equal levels of overall oral fluency.

Language Anxiety and Achievement

There have been a number of studies in a number of instructional contexts with varying target languages which find a negative relationship between specific measures of language anxiety and language achievement. In the first study using the FLCAS (Horwitz, 1986), there was a significant moderate negative correlation between foreign language anxiety and the grades students expected in their first semester language class as well as their actual final grades, indicating that students with higher levels of foreign language anxiety both expected and received lower grades than their less anxious counterparts. MacIntyre and Gardner (1989) also found significant negative correlations between a specific measure of language anxiety (French class anxiety) and performance on a vocabulary learning task.

With respect to a target language which is typically perceived as difficult by English-speakers, Aida (1994) found a significant negative correlation between FLCAS scores and final grades among American second-year Japanese students. This finding was replicated by Saito and Samimy (1996) with Japanese learners at three levels (beginning, intermediate, and advanced). Similarly, in a study of Canadian university learners of French, Coulombe (2000) found a somewhat smaller (but significant) negative correlation between FLCAS scores and final grades in eleven French classes ranging from beginning to advanced. Thus, it appears that the observed negative relationship between anxiety and achievement holds at various instructional levels as well as with different target languages. However, it should also be noted that all the studies reviewed here included students at the college or university level and the relationship between anxiety and achievement in younger learners remains relatively unexplored (see, however, Sparks & Ganschow, 1996).

One study is particularly interesting because it focuses on more advanced language learners (pre-service teachers) in a non-North American context. Rodriguez (1995) found a significant negative correlation between FLCAS scores and final grades among Spanish-speaking EFL students in seven English classes in Venezuela. In this case the correlation ($r = -.57$) was somewhat higher than reported in the other studies, indicating that the two measures have almost one-third of the variance in common. Considering all the possible influences on final grades, this seems a very substantial correlation and raises the possibility that language anxiety is also an important issue among language teachers, as Horwitz (1996) argues.

Finally, in an Asian EFL context, Kim (1998) not only found significant negative relationships between FLCAS scores and final grades but also reported an interesting difference in the relationship when observed in a traditional reading-focused class and a conversation class. Specifically, students were considerably less anxious in the reading class than in the conversation class. Thus, this study appears to support teachers' and students' intuitive feelings that language classrooms which require oral communication are more anxiety-provoking than traditional classrooms.

Several studies have also noted a negative relationship between language anxiety and outcome measures other than final grades. Trylong (1987) found a negative relationship between anxiety and teacher ratings of achievement; MacIntyre, Noels, and Clément (1997) observed a negative relationship between anxiety and students' self-ratings of their language proficiency. Gardner and MacIntyre (1993) present perhaps the most extensive set of findings with respect to language anxiety. Using measures of both classroom anxiety and language use anxiety, they found significant negative correlations with several language production measures including a cloze test, a composition task, and an objective French proficiency measure. Interestingly, they found somewhat higher negative correlations between student anxiety scores and their self-ratings of French competence than with their actual performance on the tests of French ability. Finally, with respect to some of the nonlinguistic but hoped-for goals of language instruction, Spitalli (2000) found a negative relationship between FLCAS scores and a measure of attitudes toward people of different cultures in American high school language learners of French, Spanish, and German.

One final point about the achievement studies seems relevant; that is, levels of foreign language anxiety may vary in different cultural groups. While Horwitz (1986) and Aida (1994) found relatively similar means on the FLCAS for American foreign language learners, Truitt (1995) found relatively higher levels in Korean EFL learners, and Kunt (1997) found somewhat lower levels in Turkish and Turkish-Cypriot learners of English. It also seems, as reported above, that for American learners of foreign languages, at least, anxiety levels do not vary with respect to target language (Aida, 1994; Horwitz, 1986; Saito, Horwitz, & Garza, 1999).

Possible Confounding in the Achievement Studies

Whenever the statistical procedure of correlation is used, as it was in the achievement studies reviewed here, it is not possible to be sure of the direction of the correlation or to rule out the possibility that some uncontrolled variable is responsible for any relationship which has been observed between the two variables under study. In the case of anxiety, it seems especially important to consider that students who do poorly in language classes would naturally (and logically) become anxious. These concerns form the basis of a number of papers which seek to determine sources of foreign language anxiety. For example, Young (1986) found that a significant correlation between anxiety and performance on an oral examination in French and Spanish dissipated to a chance level when actual second language ability was controlled. She reminded readers, however, that the oral examination used in the study was only a practice one and that the participants were advanced language learners (pre-service teachers). She therefore speculated that these students were not experiencing sufficient levels of anxiety to inhibit their performance. In addition, she suggests that in the case of advanced learners such as these, anxiety would probably be a greater hindrance to their ability to perform than to their development of L2 proficiency. (See also Rodriguez, 1995, and Horwitz, 1996).

Contrary to Young's results, Phillips (1992) found a significant negative correlation between FLCAS scores and performance on an oral interview examination even when ability in the form of students' written examination averages was statistically controlled. This study may be more representative of the relationship between anxiety and oral performance in actual language classes than Young's because the students were participating in an oral interview for which they would receive a grade and were third-semester college French students rather than pre-service teachers.

There has also been a strand of research which has strongly questioned the existence of foreign language anxiety independent of language achievement. In a series of studies, Sparks and Ganschow and their colleagues (see for example, Ganschow, Sparks, Anderson, Javorsky, Skinner, & Patton, 1994; Sparks & Ganschow, 1991; Sparks & Ganschow, 1996, this volume) propose the Linguistic Coding Differences Hypotheses (LCDH) and offer a theoretical perspective for understanding relationships between foreign language anxiety and foreign language achievement: in their view, because

> FL (foreign language) learning is based primarily on one's native language learning ability (i.e., language aptitude), students' anxiety about FL learning is likely to be a consequence of their FL learning difficulties, and students' language learning ability is a confounding variable when studying the impact of affective differences (e.g., anxiety, motivation, attitude) on FL learning (Sparks, Ganschow, & Javorsky, 2000, p. 251).

Thus, Sparks and Ganschow pose a crucial question with respect to the study of foreign language anxiety and its relationship with achievement. Specifically, they ask if anxiety is a cause or result of poor achievement in language learning and propose subtle first language learning deficits as the primary cause of poor achievement. Language difficulties, they propose, "are likely to be based in native language learning and that facility with one's language "codes" (phonological/ orthographic, syntactic, semantic) is likely to play an important causal role in learning a FL" (p. 235). Indeed, Ganschow and Sparks (1991) found that less anxious language learners performed significantly better on oral and written foreign language measures as well as on the Modern Language Aptitude Test. (See also Sparks and Ganschow, this volume). It is easy to conceptualize foreign language anxiety as a result of poor language learning ability. A student does poorly in language learning and consequently feels anxious about his/her language class. Conversely, a student might do well in the class and feel very confident. The challenge is to determine the extent to which anxiety is a cause rather than a result of poor language learning.

MacIntyre (1995a, 1995b) and Horwitz (2000) have responded to the LCDH arguing for the existence of language anxiety independent of first or general language learning disabilities. Particularly, they insist that anxiety is a well-known source of interference in all kinds of learning and wonder why the case of language learning should be different. In addition, the numbers of people who experience foreign language anxiety appear to be far greater than the incidence of decoding disabilities in the general population, and many successful language learners also experience language anxiety. Perhaps most importantly, they observe that language learning requires much more than sound-symbol correspondences and argue that the LCDH is ultimately based on an overly simplified view of language learning. From all these perspectives, it appears that language anxiety fits the general criterion for an anxiety which by definition is an unrealistic reaction to a particular situation. Anxious language learners feel uncomfortable with their abilities even if their objective abilities are good.

Anxiety under Different Instructional Conditions

Understandably, language teachers would like to know the sources of language anxiety so that classes may be organized in a manner which minimizes student anxiety reactions. Unfortunately, the answers are not clear-cut. Koch and Terrell (1991) found that even within Natural Approach classes—a language teaching method specifically designed to reduce learners' anxiety—learners were more comfortable participating in some activities, such as pair-work and personalized discussions, than others. However, they also found great variability in learner reactions to the activities. In almost all cases, any task which was judged "comfortable" by some language learners was also judged "stressful" by others. On the other hand, Young (1990) found that American secondary language students generally preferred and felt more comfortable participating in oral activities in small groups rather than in front of the whole class.

When considering the issue of language anxiety and classroom practice, it is important to keep cultural differences in mind. In addition to the individual variation in student reactions that Koch and Terrell found, it is entirely possible that some practices perceived by one group of learners as comfortable may prove stressful for learners from a different cultural group who are used to different types of classroom organizations.

Fortunately, one study indicates that classroom atmosphere rather than specific instructional activities may decrease student anxiety levels. Palacios (1998) examined the impact of classroom climate on students' levels of foreign language anxiety and found that several components of classroom climate were associated with higher (and lower) levels of anxiety. Most importantly, the level of perceived teacher support had the strongest relationship with students' feelings of anxiety. According to the instrument used in the study, teacher support is defined as "the help and friendship the teacher shows toward students; how much the teacher talks openly with students, trusts them, and is interested in their ideas" (Trickett & Moos, 1995). Thus, according to this finding, it may be possible to reduce the anxiety of language learners by offering them sincere support and interest. (This finding is very comforting to me because I believe that many language teachers will be pleased to extend these human qualities to their students to an even greater degree.) Palacios also found that classroom levels of affiliation among the learners, lack of competition, and clear task orientation were associated with lower anxiety levels.

The focus of instruction may also impact language anxiety. As reported earlier, Kim (1998) found that students in a conversation class experienced higher anxiety levels than students in a reading class. In addition, Saito, Horwitz, and Garza (1999) found that the students tended to experience lower levels of reading anxiety than general foreign language classroom anxiety. Thus, it appears that no matter what the classroom environment, language learners may experience some inherent levels of anxiety when participating in oral activities. However, Palacios' findings imply that it may be possible to keep anxiety levels to a minimum with a supportive and constructive classroom environment.

Two studies of learner perceptions of anxiety also point to ways that teachers can make their students feel more comfortable. In a study of Turkish learners of English, Aydin (1999) found that students felt that their anxiety resulted from personal concerns such as negative self-assessment of language learning ability and high personal expectations as well as certain classroom practices like speaking in front of the class. Interestingly, like Palacios' learners, these Turkish students identified their teacher's manner as an important source of anxiety. In addition, many of the American community college students in Donley's (1997) study reported being anxious about speaking Spanish in class, taking written and oral tests, and completing lengthy or difficult assignments. They also reported several successful coping strategies, including studying, getting the unpleasant task over with, deep breathing, and positive self-talk. In terms of their preferred teacher behaviors, these students suggested not calling on individual students, not teaching the language as a massive memorization task, and being sensitive to students' out-of-class obligations.

Anxiety and Other Language Skills

As shown in the previous discussions, foreign language anxiety has been almost entirely associated with the oral aspects of language use. However, there has been a recent trend to identify more specifically the sources of anxiety and the relationship of anxiety to various second language proficiencies. In an exploratory study seeking to determine if reading is anxiety-provoking for some language learners, Saito, Horwitz, and Garza (1999) found a .5 correlation in groups of American learners of French, Russian, and Japanese between general classroom foreign language anxiety as measured by the FLCAS and a newly developed measure of specific foreign language reading anxiety. In addition, they found negative relationships between both the FLCAS and the reading anxiety measure and final grades, although the relationship between reading anxiety and achievement was smaller than for the FLCAS. These findings suggest that some people find reading in the target language anxiety-provoking and that foreign language reading anxiety is distinguishable from general foreign language classroom anxiety. Interestingly, this study found that unlike general foreign language anxiety, students had differential levels of reading anxiety based on their particular target language. Japanese students were the most anxious about reading, followed by French students. This ranking of anxiety levels was surprising to the researchers who had anticipated that reading Japanese would be anxiety-provoking but had hypothesized that reading Russian would be more anxiety-provoking than reading French because of the use of the Cyrillic alphabet. In a second reading study, Sellers (2000) found that reading anxiety negatively impacted learners' recall of Spanish texts, replicating a finding by Oh (1990) with Korean EFL learners. And in a study of foreign language listening anxiety, Kim (2000) found a negative relationship between foreign language listening anxiety and listening proficiency in university level English learners in Korea.

In a more comprehensive study, Cheng, Horwitz, and Schallert (1999) attempted to differentiate the components of general—probably oral—language anxiety and second language writing anxiety. Using factor analytic techniques, they found that the anxiety generally associated with language classes and writing anxiety were clearly distinguishable. However, both constructs had an interesting characteristic in common: students with higher levels of anxiety tended to have low self-concepts as language learners. These findings underline the importance of teacher support as noted previously. They also suggest that language anxiety is multifaceted, and therefore imply that instructional interventions need to be tailored to the specific concerns of each learner.

Conclusion

In understanding the relationship between anxiety and achievement in language learning, it is important to distinguish the role of anxiety in language learning from its role in language performance. It is often difficult to determine if anxiety has actually interfered with learning, thus influencing achievement levels, or if anxious learners simply have difficulty displaying the language competence they have attained. While the studies reviewed in this chapter offer some insight into this topic, the issue is unresolved. On the other hand, whether and to what extent anxiety is negatively related to second language achievement is only one (and perhaps not even the most important) issue to consider when discussing anxiety and language learning. The large number of language learners and language teachers who have personal experiences with tension and discomfort related to language learning call for the attention of the language teaching profession.

In recent years, I have grown more interested in the experience of second language learning than in the simple prediction of its success. While language anxiety appears to be an important variable in explaining differential success in language learning, I feel that it is even more important in understanding the frustration and discomfort too many people endure when learning a second language. The studies reviewed in this chapter point to a consistent minority of language learners who find language learning an uncomfortable and unsettling experience. They also suggest some promising avenues for creating more supportive classroom environments and helping students deal with their anxieties. Thus, in addition to contributing to our understanding of second language achievement, language anxiety is fundamental to our understanding of how learners approach language learning, their expectations for success or failure, and ultimately why they continue or discontinue study.

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This factor analytic study is the first to differentiate anxieties related to different second language skills. At the same time, it finds underlying similarities between the two types of language anxieties examined here, second language writing anxiety and general foreign language classroom anxiety.

Horwitz, E. K., Horwitz, M. B., & Cope, J. A. (1986). Foreign language classroom anxiety. *The Modern Language Journal, 70,* 125–132.

This classic paper articulates the concept of foreign language anxiety, places it in a framework of related anxieties, and offers an instrument, the FLCAS, for its measurement. In addition, it offers student self-reports of foreign language anxiety and discusses possible causes and interventions.

Horwitz, E. K., & Young, D. J. (Eds.) (1991). *Language anxiety: From theory and practice to classroom implications*. Upper Saddle River, NJ: Prentice-Hall.

This edited volume contains both classic articles on language anxiety (e.g., Scovel, 1978, and Horwitz, Horwitz, & Cope, 1986) and original articles concerning research findings and instructional practice. Its six sections address anxiety and language learning; conceptualizations and research paradigms; empirical findings; student perspectives; and teaching and program strategies. Each section begins with an introduction and analysis by the editors.

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This study examined the factor structure underlying 23 anxiety scales and concludes that language anxiety is indeed distinguishable from other anxiety types. In addition, it examined the relationship between language anxiety and L2 processing. It found that language anxiety did interfere with L2 processing but not L1 processing. This study offers important evidence of how and why language anxiety inhibits second language learning.

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This review summarizes research on affective variables in second language acquisition and concludes that L2 learning difficulties are really based in L1 learning disabilities, particularly difficulties in phonetic encoding. The authors argue that the LCDH is a more valid explanation for observed differences in L2 achievement. In addition, they suggest that the language teaching profession undervalues language-based explanations for low achievement and recommend a return to the use of language aptitude tests to help understand, diagnose, and ameliorate language learning difficulties.

Young, D. J. (Ed.) (1999). *Affect in foreign language and second language learning: A practical guide to creating a low-anxiety classroom atmosphere*. Boston: McGraw Hill.

This volume offers practical guidance to teachers who wish to minimize anxiety in language learning. It is particularly useful in that it addresses all aspects of language learning—listening, speaking, reading, writing, and culture—and offers specific suggestions for reducing anxiety during many common language class activities. Because it appears that some amount of anxiety is inherent in language learning, this volume is an invaluable resource to teachers.

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8. THE PSYCHOLINGUISTICS OF BASIC LITERACY

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We review major issues in research on reading, including theories of word reading, cross-writing system comparisons, comprehension, reading difficulties, learning how to read, and cognitive neuroscience studies of reading. Each of these topics has psycholinguistic components that reflect the language foundations of reading. These foundations lie in two facts: (1) a writing system connects to a linguistic system at one or more levels, meaning that word reading is partially a psycholinguistic process; and (2): reading comprehension shares processes (e.g., parsing) with general language comprehension. One trend of recent research is the development of models of word identification that rely on single rather than dual mechanisms and their extension to explain reading difficulties. Another is the conclusion that phonology plays a role in reading that cuts across writing systems. Reading comprehension research continues to reflect two different traditions, sentence parsing and text comprehension. Both show increasing influence of general cognitive explanations, as opposed to strictly linguistic explanations, for comprehension phenomena. Studies of brain activation bring converging evidence on reading processes and provide neuroanatomical correlates of reading problems. In one area, the acquisition and teaching of reading, advances come from increasing consolidation and practical use of previous research gains.

Psycholinguistic processes are central to reading, which is the exclusive focus of this review. Our definition of reading is focused: *the conversion of written forms into linguistic messages*. In this definition, the study of reading is, in part, the study of language processes, including comprehension. What distinguishes reading most clearly from spoken language processes is the conversion process, or decoding. Beyond decoding, reading shares some linguistic and general cognitive processes with spoken language in the processes of comprehension. Given this perspective on the penetration of language processes throughout reading, the following review sections examine skilled reading, reading difficulties, and the acquisition of literacy. In presenting a general framework for the review, we attempt to characterize what we see as important developments in the psycholinguistics of reading.

Language Processes in Skilled Reading

Reading uses both the language of the reader and the writing system that encodes that language. Specifically important are (a) the identification of words and (b) the engagement of language and general cognitive mechanisms that assemble these words into messages. Because the process begins with a visual input that is part of a conventionalized writing system, an analysis of reading includes the role of the writing system and the units it provides to map onto the language system.

Reading and Writing Systems

Because writing systems are the result of human invention and refinement, they vary in their deep design principles (which define the writing system itself), their implementation in a particular language (the orthography), and their appearance (the script). The significance of writing system analysis for literacy lies in the importance of comparative studies for questions of skilled word identification and reading acquisition. The conventional distinction among alphabetic, syllabic, and logographic systems (Gelb, 1952) groups English, Italian, Russian, and Korean as *alphabetic writing systems*, in which graphic units associate with phonemes. Arabic, Hebrew, and Persian represent modified alphabetic systems, in which vowels can be omitted. Japanese Kana is a syllabary system, in which graphic units correspond to spoken language syllables. The logographic system is, at least among current systems, uniquely represented by Chinese (along with adaptations of this system into the Japanese Kanji and Korean Hanja). In such a system, the graphic units associate primarily with whole words or lexical morphemes.

Although Chinese approximates this logographic concept, its partial representation of single syllable-single morpheme pronunciation suggests a classification as morpho-syllabic (DeFrancis, 1989). Thus in Chinese, the compound character 洋 (pronounced “yang2" and meaning ocean) has two components; the left component signifies that the character meaning has to do with water, while the right component is a character that when it stands alone is also pronounced as “yang2” (羊, meaning sheep.) This combination of meaning and pronunciation information inside a character is very far from perfect, but it is frequent enough to challenge the assumption that it is a pure logographic system. Indeed, pure logographic systems seem not to exist among current writing systems.

Written Word Identification

Visual word identification is the process most distinctive to reading. In an alphabetic writing system, perceptual processing of a letter string results in the activation of the *grapheme units* (individual and multiple letters) of words. In traditional models, these words are represented in the reader's *lexicon*, a mental representation of word forms and meanings. Successful word reading is a match between the input letter string and a word representation. As part of this process, *phonological units*, including individual phonemes associated with individual letters, are also activated. Indeed, the research now points to the conclusion that it is the joint contributions of graphemic and phonological units that yield the identification of a word.

It is common to refer to the phonological contribution to this process as "phonological mediation." In the framework of traditional representational models, there are two pathways, one from graphemic units to meaning directly, and one from graphemic units to phonological units, and then to meaning (the mediation pathway). In this Dual Route Model (Coltheart, 1978), the direct pathway can be used for words that become highly familiar and must be used to read so called "exception words" (e.g., *café)* for which an indirect phonological route would fail. And the phonological route must be used to read pseudowords (e.g., *nufe*) for which there is no lexical representation to access. These issues of mediation and one vs. two routes are central points of contrast between traditional representational models and more recent alternative theoretical models.

These alternative models share the idea that words are not represented in a mental lexicon, but rather emerge from processing activity. One class of models assumes that words emerge from patterns of parallel and distributed activation (Plaut, McClelland, Seidenberg, & Patterson, 1996). In resonance models, word identification results from the stabilization of dynamic patterns that are continuously modified by interactions among inputs and various dynamic states resulting from prior experience (Van Orden & Goldinger, 1994). An interesting feature of this model is that patterns of graphic-phonological activation stabilize more rapidly than do patterns of graphic-semantic activation. In effect, a word form becomes identified primarily through the convergence of orthography and phonology. Meaning is slower to exert an influence on the identification process.

These contrasting approaches to cognitive architectures have been central in word reading research in recent years. The empirical results in this area have accumulated enough so that there is strong consensus about the facts of alphabetic word reading. Although there appear to be relevant data for deciding between representational and nonrepresentational models (e.g., Besner, Twilley, McCann, & Seergobin, 1990; Coltheart, Atkins, & Haller, 1993; Seidenberg & McClelland, 1990), both classes of models can account for many of the same results.

Models of word identification have not generally been sensitive to the linguistic structure of words. In both representational and nonrepresentational models, a letter string has usually been treated like any other stimulus. And its spoken language counterpart, to which the graphic stimulus must be connected, has been treated like any other association. One theory, however, specifies a functional internal linguistic structure during the word identification process. In this two-cycles model (Berent & Perfetti, 1995), vowels and consonant phonemes are assembled separately from a graphic input. Consonants are assembled more quickly than vowels. This separation of vowels and consonants can arise either from fundamental phonological considerations or from the fact that, in English, the grapheme-phoneme mapping is more reliable for consonants than for vowels.

The case of Chinese provides maximal contrast with alphabetic reading. However, recent research has overturned the idea that reading Chinese avoids phonology by mapping characters to meaning. For example, when Chinese readers make judgments about whether two characters have the same meaning, interference results when the two characters happen to have the same pronunciation (Perfetti & Zhang, 1995). This remarkable role of phonology where the writing system does not require it suggests that reading includes highly general processes that must refer to spoken language representations. A strong form of this generalization is the Universal Phonological Principle (Perfetti, Zhang, & Berent, 1992), which is that reading in all writing systems engages those phonological units provided by the writing system at the earliest opportunity. The Constituency Model (Perfetti & Tan, 1999) incorporates the basic idea that Chinese characters, like English words, are interconnected networks of graphic, phonological, and semantic units with immediate activation of all components from visual input.

Skill Differences in Word Identification

Individual differences in word reading skill are wide ranging, observable among select groups of college students as well as children. Individuals of extremely low skill are said to have a specific reading disability, or *dyslexia,* provided they also show a discrepancy between their achievement in reading and their achievement in other domains. However, there are reasons to blur the distinction between specific and nonspecific reading problems for some purposes. The processes that go wrong in a specific disability may not be much different from those that go wrong for an individual who also has a problem in some other area (Stanovich & Siegel, 1994). For both groups, their problems must be understood in terms of the processes of reading that can go wrong.

Readers of low skill show problems in reading words and pseudowords. The theoretical models of reading processes provide distinctive explanations for these problems. Dual Route Models allow two different sources of word reading difficulties: Either the direct (print-to-meaning) route or the indirect (print-to-phonology-to-meaning) route can be impaired (Coltheart et al. 1993). These models provide an explanation for both developmental and acquired dyslexia. In acquired dyslexia, surface dyslexics have selective damage to the direct route, whereas phonological dyslexics have selective damage to the phonological route. In developmental dyslexia, children may have a phonological deficit or an "orthographic" (direct route) deficit. In contrast, the newer single mechanism models with learning procedures give an alternative account of developmental dyslexia: Only phonological dyslexia is the result of a processing defect. Surface or orthographic dyslexia becomes a delay in the acquisition of word-specific knowledge (Harm & Seidenberg, 1999), which comes through experience. The successful application of both single-route and dual route models to reading problems illustrates that understanding reading problems depends on the theoretical understanding of reading processes.

Reading Comprehension

Whether reading uses just those processes that serve spoken language or requires something more turns out to be a difficult question. Clearly, reading comprehension depends on spoken language comprehension. For adults, correlations between spoken language and reading comprehension are in the range of $r = .90$ for adult samples (Gernsbacher, 1990), leaving little unique variance to reading. For children, the correlations are lower and increase during schooling (Curtis, 1980; Sticht & James, 1984). The interpretation of these correlations is that reading comprehension skill approaches listening comprehension skill as printed word identification is mastered. However, such correlations are based on the use of formally equivalent texts across listening and reading. Although this equivalence is a methodological necessity, it masks the possibility that the correlations include a text component; the texts are literate texts, characteristic of printed language rather than spoken language. However, what we read constitutes a sample of language different along formal, semantic, and pragmatic dimensions from what we speak. It is even possible that with literacy come some significant changes in the way people process spoken language (Olson, 1977), a development that would also boost the correlation of listening and reading comprehension. The conclusion thus has to be carefully cast: Reading comprehension strongly depends on listening comprehension, but whether that is all there is to the relationship remains an open question.

Components of Comprehension

Reading comprehension entails processes beyond visual word identification: the selection of contextually appropriate word meaning, the parsing of sentences, and the construction of an integrated understanding of the text across sentences.

Parsing. Most of the research on parsing has been carried out in reading experiments, giving an ironic twist to the assumption among linguists that spoken language is primary, with written language secondary. This makes parsing a more appropriate topic for literacy than might be supposed.

The main question has been how the language processor determines the linguistic constituent structure of an input string. For example, a sentence that begins with *When the boys strike the horse* encourages the comprehender to construct a transitive representation, with *the horse* as the object of the verb *strike*. However, when the sentence continues with the verb *kicks*, the comprehender now must restructure the parse so that *the horse* is the subject of the main clause verb (*kicks*) rather than the subordinate clause object of *strike*. The main question for psycholinguistic research has been what factors influence the original decision. A secondary question has been how the correct restructuring is achieved.

A central fact to be explained is the processing difficulty that occurs at a critical word that signals a parsing error (*kicks* in the above example). Increased error rates (Ferreira & Henderson, 1991), slower reading times (Frazier & Rayner, 1982; Sturt, Pickering, & Crocker, 1999), longer eye fixations (Frazier & Rayner, 1982), and increased amplitudes in wave-forms registered in ERPs (Event Related Potentials) (Friederici & Meckinger, 1996; Osterhout, Holcomb, & Swinney, 1994) are associated with the appearance of this critical word. Most of the explanations center on the parser's earlier decision on the phrase *strike the horse*, the source of the parsing error.

Frazier and colleagues proposed two highly general structural principles to control initial parsing decisions, Minimal Attachment and Late Closure (Frazier 1987; Frazier & Fodor, 1978; Frazier & Rayner, 1982). On Minimal Attachment, the parser prefers attachments that require fewer nonterminal nodes; Late Closure keeps a constituent open as long as possible, closing it only if the current item cannot be attached to it. In most cases, these two principles create a preference for attaching items low in the parse tree, leading to a preference to attach the NP *the horse* to the open VP constituent (V:strike / NP: ___), and making it difficult to raise the NP from the lower object position to the subject position of the following clause. This is because the parser applies its structure-building principles without regard for the lexical properties of the items in the word string. Mitchell (1994) provides a still valuable review of the research on these attachment issues.

In recent years, alternative proposals have emphasized a broader range of influences on initial parsing, sacrificing the simplicity of a small number of principles for multiple constraint satisfaction, focusing especially on lexical information (MacDonald, Pearlmutter, & Seidenberg, 1994; Trueswell & Tannenhaus, 1994). For example, the processing difficulty in the above example (*When the boys strike the horse kicks)* comes from a frequency-based preference for the transitive reading of *strike* over its intransitive reading. Because the problem sentence requires the less frequent intransitive reading, a parsing error occurs. Although these models include structural information, they emphasize *lexical* over *structural* operations in parsing.

A recent development is the differentiation of constituent structures in terms of parsing influences. For example, restructuring constituents that contain arguments, such as the example above (*strike-horse; kicks-horse)* is highly susceptible to lexical variables, such as subcategorization preferences, frequency of competing structures, and plausibility of arguments (Garnsey, Pearlmutter, Myers, & Lotocky, 1997; Sturt et al., 1999; Trueswell & Tannenhaus, 1994). In contrast, restructuring of nonobligatory constituents such as modifying adjuncts appears to be less affected by lexical factors and more influenced by contextual factors (Britt, Perfetti, Garrod, & Rayner, 1992). This has led Frazier and Clifton (1996) to propose a bifurcated parsing mechanism with distinct attachment mechanisms for arguments and adjuncts. The effect of such a proposal is to make processing principles less global—more connected to both structural specifications and cognitive mechanisms.

This development may signal a move in psycholinguistic research towards a cognitive resource-oriented approach, within which the role of memory becomes critical. Recent proposals have suggested that restructuring, as well as initial parsing preferences, may be limited by the availability of items required during restructuring (Gibson & Thomas, 1999; Lewis, 1998). Thus, preferences for low attachments are also preferences for recent (more available) attachment sites, and lexical preferences reflect "resting activation" levels that are determined by relative frequencies. Even the argument/nonargument distinction can be recast in terms of resource limitations, insofar as argument reanalyses require the retrieval of decayed alternatives, whereas nonargument adjuncts have no ready-made alternatives to retrieve. This approach for understanding the nature of language comprehension appears to bring psycholinguistics into closer contact with research on memory interference (e.g., Fernandes & Moscovitch, 2000; Lewis, 1996) and lexical retrieval (e.g., MacDonald, Perlmutter, & Seidenberg, 1994; Twilley & Dixon, 2000). Finally, another recent development is research on the role of prosodic and intonational information in parsing (Bader, 1998; Kjelgaard & Speer, 1999; Schafer, Speer, Warren, & White, 2000), which can help test the assumption that results from reading generalize to spoken language.

Text comprehension. Research on how readers understand texts beyond single sentences has little concern with syntax, assuming that the sentences to be understood and integrated into a coherent representation have already been parsed. What counts here is how the reader comes to construct mental models of the text and the situations described in the text.

Two classes of mental models are needed, a model of what the text says (the text base) and a model of what the text is about (the situation model; Kintsch, 1998; van Dijk & Kintsch, 1983). The text base is a mental representation of the propositions of the text, as extracted from the reading of successive sentences, supplemented only by inferences necessary to make the text coherent. The reader builds a situation model from the text base by combining knowledge sources through additional inference processes. Thus, a text base is essentially linguistic, consisting of propositions derived from sentences, whereas a situation model is essentially agnostic in its form of representation.

Some research has sought to demonstrate that situational models are, however, fundamentally nonlinguistic. One approach has been to study texts that encourage spatial representations. A variety of experimental tasks has been employed to demonstrate that the spatial information readers represent cannot be reconstructed solely on the basis of linguistic propositions. In particular, these representations preserve unstated but inferrable spatial relations, more readily conceived as spatial analogs rather than propositions (Glenberg, Kruley, & Langston, 1994; Haenggi, Kintsch, & Gernsbacher, 1995).

More recently, there has been a growing interest in narrative situations, where time, rather than space may organize the reader's model. For example, Zwaan (1996) has demonstrated that readers use time phrases in a narrative—phrases such as *an hour later* or *a moment later*—to build temporal models. Zwaan, Langston, and Graesser (1995) argue that readers construct representations of stories along five dimensions—time, space, protagonist, causality, and intentionality. Their event-indexing model assumes that events and the intentional actions of characters are the focal points of situation models, which are updated during reading along some or all of these dimensions. Another trend has been the study of multiple texts, which, when they deal with a single shared situation, more strongly force a distinction between texts and situations (Perfetti, Rouet, & Britt, 1999).

Inferences. Because texts are never fully explicit, text research has had an enduring interest in how readers make inferences that add to a text's explicit content. Indeed, the main difference between a text base and a situation model is assumed to be one of inferences, with text bases inferentially poor and situation models inferentially rich.

Inferences that are needed to maintain text coherence may be made routinely by linking anaphora with their antecedents. This is the main device seen in an influential theory of comprehension, the Construction-Integration Model (Kintsch, 1988; 1998). Readers seek to make what they are reading referentially coherent, so either a pronoun or a noun without a clear referent triggers a process to establish co-reference with something available from the text representation. These co-referential inferences are considered minimal—needed merely to make reading a text something different from reading a list of unrelated sentences.

More controversial is the occurrence of inferences beyond these minimal ones. The idea that many inferences are made during reading "on-line" (at the first moment they are allowed by the text) has been attractive for theories that emphasize knowledge use over linguistic input. However, the evidence on how likely readers are to go beyond the minimum is mixed. Although readers may make elaborative inferences under the right conditions (O'Brien, Shank, Myers, & Rayner, 1988), the bulk of the evidence suggests they do not do so routinely (Corbett & Dosher, 1978; McKoon & Ratcliff, 1992). Inferences that are intrinsic to the causal structure of the text may be more likely to be made than other kinds of elaborative inferences (Trabasso & Suh, 1993). The major theoretical issue in inferences can be captured by the contrast between the minimalist hypothesis (McKoon & Ratcliff, 1992) and the constructionist hypothesis (Graesser, Singer, & Trabasso, 1994), which allows a variety of inferences—those that address the reader's comprehension goals, those that explain why things occur, and those that establish global as well as local coherence.

We can summarize the state of affairs this way: Readers make some inferences in the service of coherence, perhaps those that aid the coherence of the *narrative structure* (a situation model for a story) as well as that of the text. Other inferences, e.g., predictive inferences that anticipate some event or some consequence of an action not required by considerations of either text or causal coherence, are less probable in many circumstances. They require effort and are subject to error. Many readers can become more active readers, making more inferences and other elaborations, under the right circumstances. But under the mundane demands of typical experiments, there is little motivation to become an inference generator.

Skill Differences in Reading Comprehension

Any component of comprehension is a candidate for "breakdown" that causes low reading comprehension achievement—parsing, sentence integration, inference making, and other components may be involved. However, because the higher levels of processing rely on output from lower levels, an observed problem in text comprehension can also result from lower level processes, including word identification.

Structure building problems. One important set of ideas on individual differences comes from the Structure Building Framework (Gernsbacher, 1990), which frames comprehension skill around the assumption that readers, in constructing a coherent framework for a text, must activate and enhance relevant concepts while suppressing irrelevant concepts. The suppression hypothesis is that less skilled readers have deficient suppression mechanisms. To illustrate, in the sentence, *He dug with the spade*, the final word has two meanings, but only one fits the context of the sentence. However, when adult readers are immediately asked to decide whether a following word is related to the meaning of the sentence, their decisions are initially slow for the word *ace* (related to the inappropriate meaning of *spade*). Both appropriate and inappropriate meanings may be activated at first. With more time before the appearance of *ace*, skilled readers show no delay in rejecting it; i.e., they "suppress" the irrelevant meaning; however, less skilled readers continue to react slowly to *ace*, as if they have not completely suppressed the irrelevant meaning of *spade*. A failure to use context is not quite what is involved here. Research on children's word identification found that less skilled readers use context in word identification at least as much and perhaps more than do skilled readers (Perfetti, 1985; Stanovich 1980). Gernsbacher's research with adults shows a similar result.

A new direction in this problem is the attempt to account for comprehension skill differences in terms of differences in lexical representations. The Lexical Quality Hypothesis (Perfetti & Hart, in press) argues that variations in the quality of lexical representations—defined in terms of interlocking knowledge of phonology, orthography, and meaning for specific words—lead to variations in observed comprehension. In this account, suppression failure is not an independent contributor to comprehension problems.

Skill differences in syntactic processes. Less skilled readers often show a wide range of problems in syntax and morphology. The question is whether such problems arise from a deficit in processing syntax or from some other source, especially working memory or lexical processing limitations, that affects performance on syntactic tasks.

To illustrate one class of syntactic problems, consider two sentences with relative clauses below. (1) is the easier subject relative; (2) is the more difficult object relative.

(1) The girl that the boy believed understood the problem.
(2) The girl that believed the boy understood the problem.

The greater difficulty of (2) compared with (1) can arise from different degrees of interference they produce in the attempt to assigning a subject for "understood," which is greater in (2) where both "boy" and "girl" might be considered. Research with both children (Crain & Shankweiler, 1988) and adults (Carpenter, Miyake, & Just, 1994) suggests that syntactic problems of this kind can arise from processing limitations rather than structural deficits. King and Just (1991) found that readers with low working memory spans have problems with object-relative sentences such as (2). Moreover, these problems were most severe where the processing load was hypothesized to be the greatest—at the second verb in the object relative, i.e., "understood" in (2). Comprehension difficulties may be localized at points of high processing demands—whether from syntax or something else. If this analysis is correct, then the problem is not intrinsic deficits in syntax, but the processing capacity to handle complexity.

Another perspective on this issue is the opportunity for practice. Because some syntactic structures are more typical of written language than spoken language, the opportunity for practice is limited by the ability to read. Thus, continuing development of reading skill as a result of initial success at reading—and the parallel increasing failure as a result of initial failure—is undoubtedly a major contributor to individual differences in reading.

Higher level skill differences in text comprehension. The overall complexity of text comprehension implies several possibilities for processing failure, beyond those considered above. Problems in any component can result in a less integrated or less coherent representation of the text.

Problems in inference making have been the target of considerable research. Oakhill and Garnham (1988) summarize evidence suggesting that less skilled readers fail to make a range of inferences in comprehension. When skill differences in inferences are observed, their cause—occurring in the absence of lexical, working memory, or general language processes—is seldom clearly demonstrated. However, there has been some success in identifying a relatively small percentage of children whose problems can be considered at least comprehension-specific, although highly general across reading and spoken language (Stothard & Hulme, 1996).

Another example is comprehension monitoring, the reader's implicit attempts to assure a consistent and meaningful understanding. Skilled readers can use the detection of a comprehension breakdown (e.g., an apparent inconsistency) as a signal for re-reading and repair. Less skilled readers may fail to engage this monitoring process (Baker, 1984; Garner, 1980). However, such differences may not be independent of the reader's ability to construct a simple understanding of the text (Otero & Kintsch, 1992). The general interpretive problem here is that comprehension monitoring, like inference making, both contributes to and results from the reader's text representation. This makes it difficult to attribute comprehension problems uniquely to failures to monitor comprehension, as opposed to more basic comprehension failures.

For comprehension to succeed, readers must import knowledge from outside the text. Thus, a powerful source of comprehension skill differences is the reader's access to knowledge needed for a given text (Anderson, Reynolds, Shallert, & Goetz, 1977). However, readers of high skill can compensate for lack of knowledge to some extent (Adams, Bell, & Perfetti, 1995). It is the reader who lacks both knowledge and reading skill who is assured failure. The deleterious effect of low reading skill (and its motivational consequences) on learning through reading creates readers who lack knowledge of all sorts.

Literacy Acquisition

In learning an alphabetic writing system, a child comes to learn that letters and strings of letters correspond to speech segments. In principle, this learning might occur implicitly (through the extraction of print-speech correspondences in text) or explicitly (through direct instruction). How much success is to be expected from strictly implicit learning is a key question for literacy education.

Complicating the picture for English is the much lamented problem of inconsistent English orthography at the letter-phoneme level. Only a little of this inconsistency translates to gain in morphological transparency. The problem in English is not the contrast between *nation* and *national*, but that between *choir* and *chore* and *head* and *bead*. European languages, including Romance, Germanic, Slavonic, and Finno-Ugrian languages, tend to be coded by orthographies that consistently map graphemes to phonemes. In contrast, the child learning English must learn that the letter string ow is read as /ow/ in the words *how* and *cow* and as /o/ in *low* and *tow*. An important recent development in the study of orthographies has been attention to mappings of larger sub-syllabic units. The rime unit, the vowel plus the syllable ending together, turns out to be very reliably pronounced in English (Treiman, Mullenaix, Bijeljac-Babic, & Richmond-Welty, 1995). Consistent with this discovery is research suggesting that learning by rime-based analogy can be effective for English speaking children at the beginning (Goswami, 1993).

Phonological Sensitivity

A major link to discovering the alphabetic principle is the child's phonemic awareness, the understanding (more-or-less explicit) that the speech stream can be segmented into a set of meaningless units (phonemes). Phonemic awareness shows a strong correlation with early reading success, and training studies with explicit instruction in phoneme segmentation produce gains in reading. The causal relationship between reading and phonemic awareness appears to be reciprocal, however. First, adults whose cultural context does not include formal schooling may fail to show phonemic awareness (Morais, Cary, Alegria, & Bertelson, 1979). Second, Chinese children who learned to read Chinese without first learning the Chinese alphabetic (pin-yin) system fail to show phonemic awareness (Read, Zhang, Nie, & Ding, 1986). Third, longitudinal studies of first grade children learning to read English find a reciprocal relationship, such that initial gains in simple phonemic awareness precede gains in reading, which in turn lead to further gains in phonemic awareness (Perfetti, Beck, Bell, & Hughes, 1987). For a summary of the evidence on the role of phonemic awareness and other factors in learning to read, see the National Research Council Report (1998). Among the most important recent developments for practice is the increased acceptance of phonological sensitivity as an important support for learning to read (see also Geva and Wang, this volume).

Theories of Learning to Read

Progress in acquiring reading skill typically has been viewed as a series of stages (e.g., Ehri, 1991; Frith, 1985; Gough & Hillinger, 1980). In such theories, the earliest stage of reading may be characterized by an attempt to learn associations between visual features of graphic forms (not complete orthographic word forms) and spoken words. A subsequent stage of graphic-phonological decoding brings on a truly productive capability in reading. The use of letter names as a bridge to phonology is an important beginning step (Ehri, 1991).

Alternative theoretical accounts emphasize the incremental acquisition of decodable lexical representations, rather than discrete stages (Perfetti, 1992; Share, 1995). Important in these theories is the role of phonology in helping to establish word-specific orthographic representations, a proposal that has come to be known as the "bootstrapping hypothesis" (Share, 1995).

Spelling

The initial expression of the alphabetic principle appears more often in spelling than in reading (Frith, 1985). Indeed, children's attempts at spelling prior to formal reading instruction typically reveal a real understanding that the sounds of a word are to be found in its letters (Chomsky, 1970; Read, 1971). This early realization can form the basis for later alphabetic reading. Eventually, in nearly all languages, the learner confronts an important fact about spelling: Typically, the mapping from pronunciation to spelling is less consistent than the mapping from spelling to pronunciation. Reading is more reliable than spelling.

An important recent idea in spelling comes from research on word identification. The more ways a sequence of phonemes can be spelled, the longer it takes to read a word that contains that sequence. For example, the word "shelf" is more efficiently read than the word "sneer" because its rime unit /elf/ is always spelled *elf*, whereas the rime unit /ir/ is spelled variously as *eer, ere, ier*, and *er*. Notice that this is not a question of consistency in the direction of orthography to phonology: *eer* is always pronounced /ir/. Stone, Vanhoy, and Van Orden (1997) reported the first demonstration of this backward consistency effect. An interesting theoretical implication is that reading words involves a feedback mechanism from phonology to orthography. It's not enough to convert a written input into a phonological representation, but a reader also verifies that the phonological representation can be spelled in the way presented. A more general implication is that spelling and reading are intimately related. The fact that spelling is typically more difficult than reading is not because these tasks use different representations, but because spelling requires additional processes that benefit from specific practice at spelling (Bosman & Van Orden, 1997).

There is a growing interest in theoretical aspects of spelling and in comparisons across languages and writing systems. For a collection of theoretical and empirical papers on spelling in different languages, see Perfetti, Rieben, and Fayol (1997).

Teaching Reading

The instructional goals for alphabetic systems would seem clear: Children need to learn that the letters of their alphabets map onto speech segments of their language. However, in English speaking countries especially, well known controversies abound over how to teach reading. Rather than focus on letter-sound correspondences, the dominant instructional approaches have emphasized instead meaning-focused instruction built around story reading, exposure to print, and enhanced language environments.

For over 30 years, the research has tended to support the effectiveness of methods that are based on direct instruction in decoding. A comprehensive ground breaking study by Chall (1967) was confirmed by later studies (see Adams, 1990) and even more recent studies (Foorman, Francis, Fletcher, Schatschneider, & Mehta, 1999). However, the practice of reading instruction remained out of touch with the research, emphasizing a variety of language activities but excluding teaching of grapheme-phoneme relationships. Much of the debate was fueled by philosophical stances and professional advocacies that have little to do with the research basis for effective teaching. (See Stanovich, 2000, for a researcher's perspective on this problem.)

However, recent indications are that a stronger consensus is emerging in favor of research-guided practice. The U.S. National Research Council (the research arm of the National Academy of Sciences) revisited this issue in its 1998 report, *Preventing Reading Difficulties in Young Children*. The NRC report reviewed available research and concluded that beginning reading "depends critically on mapping the letters and the spellings of words onto the sounds and speech units that they represent." Directly counter to the idea that somehow comprehension can proceed on its own, the report adds that "Failure to master word recognition impedes text comprehension" (p. 321).

The Cognitive Neuroscience of Reading

Finally, we take brief notice of recent developments in the cognitive neuroscience of reading. Neuroscience methods have allowed both tests of existing theories and information not available with current behavioral techniques.

One method is Event-Related Potentials (ERPs), collections of brain electrical activity recorded from electrodes pasted on the scalp. ERP is very time-sensitive, detecting events at the millisecond scale, e.g., the access of meaning from a visual word presentation. It is not, however, sensitive to spatial information, providing only approximate brain localization information. For information on brain regions, Functional Magnetic Resonance Imaging (fMRI) is proving to be a useful method, joining more established imaging methods such as PET (position emission tomography) in providing spatial information to a centimeter or even millimeter scale, but with little time sensitivity. Between them, ERP and fMRI can provide fine grained temporal and spatial information about brain activity that accompanies reading.

In skilled readers, studies of reading find lateralized function, with greater activity in the left hemisphere for frontal, temporal, parietal, and occipital sites (Crosson et al., 1999; Simos, Basile, & Papanicolaou, 1997; Small, Noll, Perfetti, & Hlustik, 1996; Wilding & Rugg, 1997). Precise fMRI locations (Crosson, et al., 1999; Pugh, Shaywitz, Shaywitz, & Shankweiler, 1997) and ERP latencies (Bentin, Mouchetant-Rostaing, Giard, Echallier, & Pernier, 1999; Martin-Loeches, Hinojosa, Gomez-Jarabo, & Rubia, 1999) may partially distinguish orthographic, phonological, and semantic processes. Imaging studies may also identify distinct verbal working memory locations (Crosson et al., 1999) and networks of regions that support oral reading (Small, Noll, Perfetti, & Hlustik, 1996). Such studies also suggest that reading Chinese involves the same brain circuitry as found in English (Tan et al., 2000), converging with the picture emerging from behavioral studies.

In studies of differences in reading skill, imaging studies have found higher skill associated with lateralization to the left hemisphere (Pugh, Shawitz, Shawitz, & Shankweiler, 1997; Segalowitz, Wagner, & Menna, 1992). In ERP experiments, skilled readers show shorter latencies of an early ERP component (P200) that indicates perception of a recognizable word (Rudell & Hua, 1997). Dyslexic subjects can be differentiated from nondyslexic subjects on the basis of brain activation, but the differential pattern that distinguishes dyslexics from nondyslexics appears not to be the same one that distinguishes nondyslexics of varying skill from each other. Dyslexia, whether developmental or acquired, is associated with brain circuitry responsible for attention (Pugh et al., 1997) and phonological processing (Georgiewa et al., 1999; Small, Flores, & Noll, 1998). Segalowitz et al. (1992) suggest that different predictors are required depending on whether the reader's ability is below or above some threshold. In addition, some structural differences have been found to distinguish dyslexics from controls (Semrud-Clikeman, Hooper, Hynd, & Hern, 1996).

One of the most promising uses of neuroscience methods concerns the effects of training on brain activation and circuitry. Not only does repeated practice increase brain efficiency (Rudell & Hua, 1997), but it can actually influence brain development and neuronal connectivity. A recent fMRI study found a thicker band of callosal connective fibers between parietal lobes for literate than for illiterate subjects (Castro-Caldas et al., 1999). Another study designed to shift an acquired dyslexic subject from a whole word reading strategy to a phonological reading strategy found that the activation patterns change from pre- to post-therapy (Small et al., 1998). Both papers describe the shift as an alteration in brain circuitry. Neuronal connectivity appears plastic into adulthood, and intervention can actually change the way the brain is structured and wired for reading.

Cognitive neuroscience methods promise to be useful across many issues in the study of reading—the components of word identification, cross-language comparisons, the acquisition of skill, and even comprehension. There remains much to learn about the specific brain regions that support specific processes. However, rather than the mapping of single regions to single processes, the results demonstrate a complex network of connections broadly distributed across brain regions in support of reading and language that emerge in response to task requirements and are subject to reorganization during learning.

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This volume includes a collection of chapters on psycholinguistic topics, including speech perception, parsing, and reading. Some chapters present cognitive analysis of language and research reviews, while others review neuroimaging and ERP methods of language study. A chapter by Perfetti (Comprehending written language: A blueprint of the reader, pp. 167–208) contains a review of the research in reading.

Frazier, L., & Clifton, C. (1996). *Construal.* Cambridge, MA: MIT Press.

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9. BILINGUAL FIRST LANGUAGE ACQUISITION: EXPLORING THE LIMITS OF THE LANGUAGE FACULTY[*]

Fred Genesee

Most general theories of language acquisition are based on studies of children who acquire one language. A general theory of language acquisition must ultimately accommodate the facts about children who acquire two languages simultaneously during infancy. This chapter reviews current research in three domains of bilingual acquisition: pragmatic features of bilingual code-mixing, grammatical constraints on child bilingual code-mixing, and bilingual syntactic development. It examines the implications of findings from these domains for our understanding of the limits of the mental faculty to acquire language. Findings indicate that infants possess the requisite neuro-cognitive capacity to differentially represent and use two languages simultaneously from the one-word stage onward, and probably earlier. Detailed analyses of the syntactic organization of bilingual child language indicates, moreover, that it conforms to the target systems and, thus, resembles that of children acquiring the same languages monolingually, for the most part. At the same time, bilingual children acquire the distinctive capacity to coordinate their two languages in grammatically constrained ways and in conformity with the target grammars during online production. In short, current evidence attests to the bilingual capacity of the human mind and refutes earlier conceptualizations which viewed bilingualism and bilingual acquisition as burdensome and potentially disruptive to development.

Language is undoubtedly the most complex faculty of the human mind. Understanding how language is acquired is a challenge of immense proportions, one that has provoked intense attention from researchers and theorists for the last fifty years. The immensity of the task is heightened by the extremely varied types of language learning that occur—there are child and adult learners, first and second language learners, learners of oral and signed languages, and monolingual and multilingual learners. The lion's share of attention has focused on children who grow up learning one (oral) language, most often English. The focus of this chapter is on language acquisition in children who grow up learning two oral languages simultaneously, what is often referred to as bilingual first language acquisition. It is important to point out, however, that multilingual acquisition and acquisition of signed as well as oral languages are implied (Petitto et al., in press; Richmond-Welty & Siple, 1999).

In addition to important practical and clinical reasons for studying bilingual acquisition—that is, to better promote full normal development and treat pathological development, there are important theoretical reasons. Most current theories of language acquisition are based on monolingual children and are silent on the case of bilingual acquisition. A general theory of language acquisition must ultimately accommodate the facts about bilingual/multilingual acquisition. This is not of trivial importance since, while we have no "hard" statistics on the number of children who acquire two or more languages simultaneously from birth onward, they undoubtedly constitute a significant population worldwide (Tucker, 1998). Nevertheless, we have scant descriptive information about bilingual acquisition and, thus, little theoretical understanding of how two languages are acquired simultaneously. Research is needed to uncover the facts and reconcile general theories of acquisition with the facts.

Furthermore, investigations of bilingual acquisition permit us to explore the limits of the language faculty of the human mind. It has been argued that humans are uniquely prepared to acquire this most complex of abilities (e.g., Pinker, 1994). Some have argued that this unique ability resides in an innate and language-specific module of the mind (Chomsky, 1997) while others have argued that it is a reflection of the application of general learning mechanisms to the specific domain of language (Bates & MacWhinney, 1987). At present, neither the nativist nor cognitivist position deals seriously with the case of bi- or multilingual acquisition and, thus, leaves unexplored both the capacity of the mind to acquire different linguistic systems at the same time and the way in which this is accomplished (see MacWhinney, 1997, for the case of second language acquisition). This chapter reviews research on three different aspects of bilingual acquisition that are pertinent to these issues:

1. pragmatic aspects of child bilingual code-mixing;
2. linguistic development of young bilingual children; and
3. grammatical constraints on child bilingual code-mixing.

Pragmatic Aspects of Child Bilingual Code-Mixing

Early theorists held that, although bilingual children are exposed to different sets of linguistic input, they go through an initial stage when they have one linguistic system; the most explicit and earliest version of this hypothesis was articulated by Volterra and Taeschner (1978). This claim applies to the abstract knowledge or "competence" that underlies bilingual performance and not to language performance or behavior itself. According to the unitary language system hypothesis, differentiation of two linguistic systems during bilingual acquisition does not begin to occur until approximately three years of age (Genesee, 1989), and, as a consequence, bilingual children are not really bilingual until around three years of age. From a neuro-cognitive perspective, this view holds that, during the initial stages of language development, the language faculty is biologically and, therefore, fundamentally "monolingual." By extension, bilingual acquisition challenges the language faculty because it exceeds its biological predispositions; therefore, it results in acquisition that differs significantly from that of monolinguals. Arguably, in the extreme, it also implicates certain costs, such as delayed language development, linguistic confusion, and/or incomplete development of either language.

Claims for an initial unitary system have been based on the frequently reported finding that bilingual children mix elements (phonological, lexical, morphosyntactic) from their two languages in the same utterance or stretch of conversation. Code-mixing can occur within the same utterance—for example, one 2-year old French-English bilingual child in our research said "**où car?**" (*"where car?"*) when searching for a car that he had been playing with; or it can occur from one utterance to the next in the same conversation—for example, the same child produced an utterance entirely in French when speaking to his English-speaking mother. Indeed, anecdotal evidence and most empirical studies indicate that most bilingual children code-mix during the early stages of development and their mixing declines with age. The precise rates and patterns of mixing vary from study to study and probably reflect a host of factors, some of which will be discussed in a later section (see Genesee, 1989, for a review).

Contrary to the unitary language system hypothesis, current evidence indicates consistently and clearly that bilingual children can use their developing languages differentially and appropriately with different interlocutors from the earliest stages of productive language use. Genesee, Nicoladis, and Paradis (1995), for example, examined 2-year-old children who were learning French and English in the home, with the mother using one language predominantly with the child and the father the other. Although the children code-mixed and often used their dominant language extensively with both parents, they nevertheless used more of their mothers' language with their mothers than with their fathers, and vice versa for the fathers' language. These findings are corroborated by other researchers (e.g., DeHouwer, 1990; Lanza, 1997a; Meisel, 1989). In a follow-up study, Genesee, Boivin, and Nicoladis (1996) found that two-year-old bilingual children in the one-word stage were similarly able to use their two languages differentially with monolingual strangers. These latter findings are significant because they indicate that (a) pragmatic differentiation is evident from the earliest (i.e., the one-word) stage of productive use; and (b) bilingual children have the cognitive capacity to identify and respond appropriately on-line to important communicative characteristics of their interlocutors (their bilingual proficiency in this case).

Such differentiated language use is difficult to reconcile with a putative unitary system insofar as one would expand random use of each language regardless of the language of the child's interlocutor if the bilingual child truly possessed a fused system comprised of elements from two input languages (see Meisel, in press, for alternative models). These findings also challenge the unitary system explanation of child bilingual code-mixing. A number of alternative explanations of mixing have been proposed. They can be classified into two broad categories—those that are input-based and those that are proficiency-based. According to input-based explanations, young bilingual children code-mix because of the input addressed to them by others. Input can influence children's code-mixing in at least two ways. First, according to the modeling hypothesis, children exposed to extensive code-mixing in the language addressed to them by other more proficient bilinguals (parents and other adults) code-mix more than children exposed to relatively less mixed input. Indeed, parents who raise their children bilingually are often counseled to use the one parent/one language rule in order to avoid code-mixing and the confusion and delays that are mistakenly associated with early bilingualism. Second, according to the discourse hypothesis (Lanza, 1992), parents who tolerate child code-mixing use certain discourse acts that indicate to the child that mixing is acceptable, and they, thereby, permit or even encourage their child to code-mix more. For example, parents who continue the conversation following code-mixing by their child indicate that the code-mixed utterance was understood and is acceptable. Conversely, parents who reply to a child's mixing by asking for clarification or by replying that they do not understand indicate that the child's mixing was ineffective and undesirable.

To date, the evidence concerning each version of the input hypothesis is surprisingly limited and largely inconclusive. Goodz (1994) reports positive and statistically significant correlations between parental and children's rates of code-mixing in families in the Montreal area who were raising their children bilingually. However, Genesee, Nicoladis, and Paradis (1995), also working with bilingual families in the Montreal area, failed to obtain statistically significant relationships between parental and children's rates of code-mixing. Likewise, Lanza (1992) reports evidence in support of the discourse hypothesis in a case study of a child raised in Norwegian and English in Norway (see also Deuchar & Quay, 2000), whereas Nicoladis and Genesee (1998) failed to find statistical evidence in support of this hypothesis in a study of five children learning English and French simultaneously.

Virtually all children, except for pathological cases, ultimately acquire the language behaviors and conversational norms of the communities in which they grow up. Undoubtedly, children raised bilingually also eventually acquire the patterns and forms of code-mixing that occur in their communities as part of their language socialization (see, Poplack, 1987, for contrasting norms of code-mixing). The inconclusive evidence reported to date on children's acquisition of code-mixing and its relationship to input factors indicates that we are a long way from understanding how bilingual children are socialized to bilingual patterns of language usage in their communities, but the question is still important and valid. Clearly, much additional research is called for.

According to the second broad category of explanations of code-mixing, the proficiency hypotheses, young bilingual children code-mix to fill linguistic gaps in their language proficiency. Arguably, a child who says "un petit *bird*" when speaking to her French-speaking mother does not know the word for "bird" (*oiseau*) in French, but does in English and, therefore, borrows the English word temporarily to complete her French utterance. Indeed, on occasion, even fully proficient adult bilinguals do this when they experience a temporary lack of memory or when an appropriate word or expression does not exist in the language they are speaking. There is considerable evidence in support of this explanation of code-mixing. First, it is commonly reported that bilingual children mix more when using their less proficient language than when using their more proficient language (Genesee, Nicoladis, & Paradis, 1995). Second, it has been documented that bilingual children are more likely to mix words for which they do not have translation equivalents than words for which they do (Deuchar & Quay, 2000; Nicoladis, 1994; Wolf, Genesee, & Paradis, 1995). The proficiency hypothesis is also consistent with reports that bilingual children tend to mix less as they get older (e.g., Redlinger & Park, 1980; Vihman, 1982)—arguably, as they acquire a more complete stock of words and expressions in both languages, bilingual children need to borrow less. While these examples have been drawn from the lexical domain, evidence in support of the proficiency hypothesis has been presented from morpho-syntactic domains as well. Gawlitzek-Maiwald and Tracy (1996) have argued that bilingual children use syntactic structures from their more developed language to bolster use of their less developed language—what they refer to as bilingual bootstrapping, and Petersen (1988) has argued that inflectional morphology from the "dominant language" can co-occur with free morphemes from the "non-dominant language," but not vice versa.

Returning to the central theme of this chapter, the important point is that child bilingual code-mixing does not reflect an incapacity of the language faculty to develop functionally differentiated systems during the initial stages of acquisition. Code-mixing is more appropriately viewed in terms of performance factors (e.g., proficiency) and not in terms of the child's fundamental underlying competence. Indeed, the pragmatic performance of bilingual children, even those in the one-word stage, reveals quite sophisticated pragmatic skills, skills that imply underlying differentiation, at least at the functional and possibly also at the representational levels.

Linguistic Development: Autonomous or Interdependent?

More direct evidence concerning the nature of bilingual children's representations of their developing languages comes from detailed analyses of their phonological and syntactic development. At issue here is the nature of the abstract knowledge (or competence) that underlies the bilingual child's language performance. The specific question is whether young children exposed to two languages acquire abstract constraints (or "rules") that are different for and specific to each of the target languages. Evidence that they do would provide additional insights into the capacity of the language faculty and, in particular, its ability to represent the abstract grammatical properties of different languages during the early stages of acquisition.

Studies on syntactic development show that bilingual children from as early as two years of age (or during the two- and early multi-word stages) use language-specific and different syntactic constructions when addressing interlocutors who speak different languages (DeHouwer, 1990; Ingram, 1981/82; Meisel, 1989, 1994; Paradis & Genesee, 1996, 1997). Likewise, studies of phonological development show that bilingual children demonstrate different phonological patterns in each language even prior to overt use of syntactically-patterned language (Celce-Murcia, 1978; Johnson & Lancaster, 1998; Paradis, 1996; Schnitzer & Krasinski, 1994). Thus, contrary to earlier conceptualizations, it is generally agreed now that the languages of the bilingual child are represented in underlyingly differentiated ways at least from the beginning of early language production, and possibly earlier. It is also interesting to note here that research on speech perception in children raised bilingually (Catalan and Spanish) indicates that they can discriminate different language-specific phonological contrasts as early as 4½ months of age, prior to the production of their first words (Bosch & Sebastián-Gallés, in press). Thus, children exposed to two languages appear to possess the capacity to perceptually discriminate different linguistic systems at birth, a capacity that is a prerequisite to establishing different representations of two languages.

That young bilingual children have differentiated representations of their two languages still leaves open the question whether their systems develop autonomously or interdependently (Paradis & Genesee, 1996). Autonomous development would be reflected in patterns of acquisition and linguistic representation that match those of monolingual children acquiring the same languages. In effect, bilingual children "look like" monolinguals. This is not to say that they are the same as monolinguals. As we shall see in the next section, bilingual children clearly have grammatical capacities permitting them to use and manage their two languages that set them apart from monolinguals. With respect to the main theme of this chapter, evidence of autonomous development would also be evidence for the capacity of the language faculty to acquire and represent the distinct structures and constraints that comprise the grammars of each language.

Paradis and Genesee (1996) define interdependent development as "the systemic influence of the grammar of one language on the grammar of the other language during acquisition, causing differences in a bilingual's patterns or rates of development in comparison with a monolingual's" (Paradis & Genesee, 1996, p. 3). Interdependence could take several forms. First, the simultaneous acquisition of two languages might pose challenges to the language faculty that could result in slower development for bilinguals in comparison to monolinguals acquiring the same languages. While this might influence general development in both languages, it could also influence development of specific aspects of one or both languages. For example, children acquiring English and Spanish simultaneously might be delayed in the obligatory use of subjects in their English as a result of exposure to Spanish, a language that licenses the omission of subjects in certain contexts. Second, and in contrast, bilingual acquisition could accelerate language development in cases where two languages share certain structural properties and especially structures that normally emerge earlier in one of the languages when acquired monolingually. For example, for reasons that are not fully understood, monolingual French-learning children acquire finite verb forms at an earlier age than monolingual English-learning children (Paradis & Genesee, 1996). Children acquiring English and French simultaneously might show an accelerated acquisition of finiteness in their English as a result of the early emergence of finiteness in their French verbs.

Yet another form of interdependence is transfer, the systematic incorporation of a linguistic property from one language into the other. For transfer to be distinguished from acceleration, it would have to result in a deviant structure or pattern in comparison to the target language—for example, generally speaking, verbal negatives in English precede the lexical verb (e.g., "I do not like raspberries."), but follow it in French (e.g., Je n'aime pas les framboises.") If English-French bilingual children were shown to place negatives after lexical verbs in English and French, this could constitute evidence for transfer and, thus, interdependent linguistic development.

The languages of bilingual children need not, nor are they likely, to develop entirely autonomously or interdependently—certain aspects might develop interdependently while the rest develops autonomously. Furthermore, interdependence might be characteristic of certain language combinations, but not others. Indeed, Paradis and Genesee (1996) report that 2- to 3-year-old French-English bilingual children from Montreal demonstrated no evidence of transfer, delay, or acceleration in the syntactic development of their languages in comparison to monolingual controls, even for structures that differ in normal monolingual acquisition. In contrast, cross-language influences have been noted by Döpke (2000) in German-English bilingual children, by Hulk and van der Linden (1996) and Müller (1998) in German-French children, and by Yip and

Matthews (2000) in a Chinese-English child. Döpke (2000) reports that Australian children learning English and German simultaneously overgeneralized the -VO word order of English to German which instantiates both -VO and -OV word orders depending on the clausal structure of the utterance. Working within the Competition Model (Bates & MacWhinney, 1987), Döpke argues that children learning German and English simultaneously are prone to overgeneralize S-V-O word order in their German because the -VO order is reinforced on the surface of both the German and the English input they hear. Hulk and Müller (2000, p. 5), have similarly argued that "there has to be a certain overlap of the two systems at the surface level" for cross-linguistic syntactic influence to occur. Structural overlap and ambiguity in the input have also been invoked as possible explanations in phonological transfer by Paradis (in press) in a study of the phonological development of French-English 2-3 year olds.

The Döpke, Hulk and Müller, and Paradis explanations, all of which emphasize the interplay between surface cues in bilingual input and the underlying structural properties of the languages being learned, highlight the unique challenge of bilingual acquisition—how to sort out two abstract linguistic systems from input that often provides ambiguous or inconsistent cues about the distinctive underlying structural properties of the target languages. It remains to be seen if other factors are at play in all cases of transfer for, as noted earlier, Paradis and Genesee (1996) did not find evidence of cross-linguistic influences in the French and English of the bilingual children they examined, despite the fact that there are features of these two languages that have the same surface features but different underlying properties (i.e., subject pronouns are clitics in French but full NPs in English). Dominance may also be at play in some instances (Matthews, personal communication).

A great deal of additional investigation is needed to explore the linguistic development of bilingual children and, in particular, the extent and nature of transfer, before we can present definitive conclusions. Nevertheless, these early findings are significant for our understanding of both bilingual acquisition and the language faculty of the human mind and, thus, are worth considering briefly. To date, the evidence indicates that, for the most part, the linguistic systems of bilingual children develop autonomously and like that of monolingual children. Instances of transfer that have been documented do not compromise this general conclusion for at least two reasons. First, transfer is temporary. We know from other research that, given sufficient exposure to two languages, bilingual children can acquire the same grammatical competence in each of their languages as monolinguals in the long run (White & Genesee, 1996). Whether or not individual children exposed to two languages at birth become bilingual is largely a matter of circumstance rather than of inherent limitations in the language faculty's ability to handle two languages at the same time.

Second, and more importantly, the extant evidence indicates that transfer during bilingual acquisition is restricted to specific aspects of syntax or phonology.

Moreover, although the transferred structures identified by Döpke and Hulk and Müller deviate from the language that hosts them temporarily, they nevertheless map onto the child's developing version of the host language in ways that respect its distinct internal structure. Recall that, to date, documented instances of transfer have involved analogous structures that share features (however, see Yip and Matthews, in press, for possible counterexamples from an English-Chinese learning child). For such cross-linguistic transfer to occur, the language faculty, be it defined in nativist or cognitivist terms, must be capable of active analysis and comparison of the respective target input systems, albeit in some abstract, implicit form. Monolingual children also exhibit nontarget constructions that deviate from adult forms but nevertheless conform to the overall structure of the target language (e.g., "*goed*" instead of *went*). However, the nontarget constructions of monolingual children are always based on the same system in which they occur. In contrast, transfer in bilinguals can cross language boundaries. That transfer in bilingual children is constrained in structure-dependent ways indicates that the language faculty is able to coordinate different linguistic systems in the course of, and arguably in the service of, development.

Grammatical Constraints on Child Bilingual Code-Mixing

In the preceding section, we examined the possibility of interactions between the developing systems of bilingual children with respect to underlying representations, or competence. In this section, we examine interactions between the bilingual child's languages during on-line production and, more specifically, during intra-utterance code-mixing. Mixing elements or structures from both languages in the same utterance clearly implicates interactions between the languages involved. Research on adult bilinguals indicates that their intra-utterance code-mixing is not random, but is grammatically constrained and, furthermore, complies with the language-specific characteristics of the participating languages (Myers-Scotton, 1997; Poplack, 1980). Although there is no consensus on the nature of the specific constraints that organize intra-sentential code-mixing in adults, there is consensus that constraints serve to avoid grammatically illicit or awkward constructions. The evidence indicates, further, that proficient adult bilinguals engage in more fluent, more sophisticated, and more prevalent code-mixing than less proficient bilinguals, since fluent mixing arguably calls for full grammatical competence in the languages involved. It is interesting to note here that while code-mixing has been linked to bilingual proficiency in the case of adults, it has been attributed to linguistic incompetence in young bilingual children.

That bilingual children ultimately acquire grammatical constraints on their code-mixing is attested by studies on adult bilinguals. The questions of concern here are whether there are structural constraints on child bilingual code-mixing, the nature of those constraints, and the age at which they are evidenced. Aside from their specific theoretical significance, these questions address the view that bilingual acquisition challenges the language faculty and, thus, poses certain risks to language development since evidence for grammatical constraints during code-mixing would argue for competence in coordinating two languages during on-line processing, much like that which has been attested in adult bilinguals.

To date, research has examined constraints on intra-utterance code-mixing by bilingual children learning the following language pairs: French and German (Köppe, in press; Meisel, 1994); French and English (Genesee & Sauve, 2000; Paradis, Nicoladis, & Genesee, 2000); English and Norwegian (Lanza, 1997a,b); English and Estonian (Vihman, 1998); and Inuktitut and English (Allen, Genesee, Fish, & Crago, 2000). The constraint models of Poplack (1980) and of Myers-Scotton (1997) have formed the basis for most, although not all, analyses in studies on this topic (except, see Köppe, in press, and Meisel, 1994, who based their analyses on more general generativist principles). The Myers-Scotton and Poplack models differ substantially in the extent to which they refer to abstract, underlying grammatical constructs (such as system and content morphemes) versus surface level grammatical phenomena (such as word order and bound versus open class morphemes), respectively.

Despite the diversity of language pairs and analytic frameworks that comprise this body of research, all researchers conclude that child bilingual code-mixing is grammatically constrained. The operation of constraints based on abstract notions of grammatical knowledge, which are at the core of Myers-Scotton's Matrix Language Frame model, is most evident in bilingual children once they demonstrate such knowledge in their languages (as marked by verb tense and agreement, for example), usually around 2;6 years of age and older, while the operation of constraints that reflect surface features of grammar (such as word order) is evident even earlier in development, prior to overt marking of abstract grammatical relations in the child's language, from the two word/morpheme stage onward. Köppe (in press) has proposed a hybrid model, composed of linear, word order constraints during the early stages of production and abstract, hierarchically-organized constraints subsequently.

Research in our laboratory has compared code-mixing in children learning language combinations that differ in typological similarity: English and French versus English and Inuktitut (Allen et al., 2000; Genesee & Sauve, 2000). Although members of different language families, English and French share many typological characteristics. Both have relatively sparse morphology, particularly with respect to inflectional morphology; the morphology they have follows a mildly synthetic pattern. Syntactic relations are indicated primarily through word order, with the basic word order being SVO. In contrast, Inuktitut, a member of Eskimo-Aleut family, is polysynthetic, with syntax being marked *within* the word, both through extensive inflectional morphology and through a variety of derivational affixes that change word class. Indeed, Inuktitut has extremely rich morphology, which includes some 400 derivational affixes and more than 1000 inflectional affixes. As well, although basic word order is SOV, word order is typically relatively free, and, in contrast to English, differences in word order are linked to discourse phenomena rather than to syntactic relations.

Poplack, Wheeler, and Westwood (1987) have found that adult bilinguals who know similarly contrasting language pairs (English-French versus English-Finnish) use different patterns of intra-sentential code-mixing. In brief, adult English-French bilinguals avoid code-mixing in utterances that contain word order or morphological contrasts in French and English, whereas adult English-Finnish bilinguals engage in extensive nonce borrowing. Nonce borrowing is a strategy in which single lexical items, usually nouns and verbs, from the donor language are syntactically, morphologically, and sometimes phonologically incorporated into the host language. In effect, the donor word is treated like a word from the host language and, thus, avoids the risk of violating the morphosyntactic constraints of the host language. Our comparisons of English-French and English-Inuktitut children also revealed differential use of these same code-mixing strategies.

In sum, these findings indicate that there is no fundamental difference between the constraints on child code-mixing and those that have been attested in adult bilinguals. Moreover, bilingual children, like adult bilinguals, adopt different code-mixing strategies in accordance with the typological characteristics of their languages. Once again, we have evidence that the language faculty is unperturbed by the complex grammatical challenges posed by bilingual acquisition even during on-line production. To the contrary, the constrained systematicity that marks early monolingual acquisition, as well as early bilingual acquisition (as noted earlier), is also evidenced in the grammatical interactions that occur when the two languages co-occur in the same utterances during child code-mixing.

Conclusions

Research on children who grow up learning two languages simultaneously indicates that, contrary to earlier conceptualizations, they acquire differentiated representations of the target languages early in development, from the one-word stage onward, and possibly earlier. This conclusion is reinforced by consistent evidence from a number of researchers that bilingual children can and do use their developing languages differentially and appropriately with familiar and unfamiliar interlocutors from the one-word stage of development. Children exposed to two languages clearly possess the requisite neuro-cognitive competencies that underlie differential representation and use of two languages from the one-word stage of development, the earliest stage of productive language use. Studies of speech perception in children exposed to two languages from birth suggest that they probably have the cognitive-perceptual capacities that are prerequisite to establishing simultaneous differentiated representations of more than one language from the very outset of exposure to two languages.

Detailed analyses of the grammatical organization of bilingual child language indicates that it conforms with the target systems, taking into account development. Analyses of child bilingual code-mixing indicate further that it is not random, but is constrained in essentially the same ways as adult code-mixing and, most importantly, in conformity with the grammatical properties of the target languages at the stage of development of the child.

The extant evidence does not mean that bilingual acquisition does not challenge some children. It surely does, just as monolingual acquisition challenges some children. There is still much to be done to identify the circumstances and causes that differentiate normal from deviant acquisition, bilingual and monolingual. Indeed, there is still much to do to extend our understanding of bilingual acquisition in its diverse forms. This chapter has touched on one constellation of bilingual acquisition—acquisition of two oral languages in the home. Bilingual acquisition occurs in different sociocultural contexts, and it entails different language combinations and modalities (signed and oral). We have barely begun to explore these diverse forms of bilingual acquisition.

In sum, research findings on bilingual children challenge the notion of the "monolingual mind" designed to handle only one language system and burdened with dual or multiple language input. To the contrary, extant results support a view of the mind that is fundamentally capable of acquiring more than one language at the same time—thus, a bilingual or even *multilingual* mind.

Notes

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This collection of chapters is based on papers presented at the VIIIth International Congress for the Study of Child Language in San Sebastian, Spain, in July 1999. It reflects a broad range of theoretical topics and state-of-the-art investigations of issues in the field of bilingual acquisition. Included are papers on infant speech perception, babbling, word learning, the acquisition of syntax, and the development of communicative competence. This collection provides a very useful and up-to-date synopsis of the diverse current trends and findings in the field.

Deuchar, M., & Quay, S. (2000). *Bilingual acquisition: Theoretical implications of a case study*. Oxford: Oxford University Press.

This book presents the findings of a case study in bilingual acquisition and explores their implications for theories of first and second language acquisition. The authors focus on the emergence of two languages (Spanish and English) during one child's second year of life. It examines the process of language learning from the perspectives of phonology, lexicon, syntax, and language choice and addresses prominent theoretical issues in each domain. This is an excellent example of the utility of case studies in language acquisition research.

Genesee, F. (Guest Ed.) (2000). Syntactic aspects of bilingual acquisition. Special issue of *Bilingualism: Language and Cognition*, *3*, 167–281.

This special issue of the journal *Bilingualism: Language and Cognition* includes 6 studies on the syntactic development of children acquiring two languages simultaneously and an Introduction to the issue by the Guest Editor. Collectively, these studies reveal that the syntactic development of bilingual children acquiring a variety of languages (French-German, French-English, English-German, Chinese-English, Catalan-Spanish, and Swedish-French) conforms for the most part to that demonstrated by children acquiring the same languages monolingually. At the same time, there is evidence of cross-linguistic transfer of syntactic features during the acquisition of languages with ambiguous or overlapping syntactic properties. Evidence is also reported of grammatical constraints during bilingual code-mixing indicating that bilingual children, like bilingual adults, can coordinate the deployment of their grammars during online production so as to avoid illicit or inappropriate syntactic patterns.

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10. METALINGUISTIC ASPECTS OF BILINGUAL PROCESSING

Ellen Bialystok

This chapter examines differences in metalinguistic development between monolingual and bilingual children in terms of three subcategories: word awareness, syntactic awareness, and phonological awareness. In each case, some studies have reported advantages for bilingual children, but equally, other studies have found either no difference between the groups, or, in some cases, monolingual advantages. In the discussion of each of these areas, the kinds of tasks for which bilingual and monolingual children perform differently are identified. In none of these three subcategories of metalinguistic awareness do bilingual children exhibit a uniform and consistent advantage over monolinguals. An alternate conception of metalinguistic ability is proposed in which two cognitive processes, analysis and control, are directly responsible for task performance. These processes are involved in all metalinguistic tasks but to different degrees. Re-examining the results in this way reveals that bilingual advantages occur reliably on tasks that make high demands on control but are not evident in tasks that make high demands on analysis. The implications of this pattern for metalinguistic ability are considered.

One of the earliest claims that dealt a blow to the emotional paranoia claiming that bilingualism was a cognitively debilitating experience for children was that there might be metalinguistic advantages for children doomed to live in this benighted state. Research in the 1970s by Ianco-Worrall (1972), Ben-Zeev (1977), and Cummins (1978) set the stage for an exploration of how bilingualism influences children's developing conceptions of language. These studies, along with the seminal work of such researchers as Peal and Lambert (1962), led to a reconsideration of the role that bilingualism plays in the cognitive life of young children. Subsequently, the most careful studies of the cognitive skills that were considered to be influenced by early bilingualism are still those concerned with aspects of metalinguistic functioning.

Once we overcome the fears surrounding the possibility of negative consequences of bilingualism for young children's intellectual development, it is reasonable to consider ways that the experience of bilingualism might alter children's developing conceptions of language. It is not logically imperative, however, that the differences between monolingual and bilingual children in their mastery of these conceptions favor the bilingual children. For example, it might be that learning two languages leads to uncertainty about linguistic structure because contradictory rules are encountered in the two languages.

The question about possible bilingual differences in metalinguistic development presupposes that metalinguistic ability is a unified developmental construct. However, there is little consensus on what demarcates metalinguistic skill from linguistic competence and even less agreement on what appropriate tests of this achievement should be. Evidence for metalinguistic functioning has varied from simple speech repairs executed by 2-year-olds to sophisticated reflections on structure entertained by 8-year-olds. The first problem, therefore, is in deciding what constitutes metalinguistic ability.

One kind of evidence for the coherence of metalinguistic ability would be its differential acquisition by bilingual and monolingual children. In other words, if metalinguistic ability is a unitary achievement, then it could be traced developmentally in specific groups. However, a cursory examination of the research reveals a diversity in the results, sometimes indicating a bilingual superiority, sometimes a disadvantage, and sometimes no difference between the groups. The majority of studies report a bilingual advantage, but the snapshot of results to which we have access through typical publication channels is undoubtedly skewed in favor of bilingual advantages. Although it is possible to publish research results that show a monolingual superiority (that is, a bilingual disadvantage), it is difficult to publish results that show no difference between groups. Journals prefer significant *p* values and dramatic conclusions.

This chapter reviews some research that has explored developmental differences in the metalinguistic ability of monolingual and bilingual children and attempts to integrate the results into an explanation of cognitive processing. Metalinguistic abilities will be examined in terms of the subcategories of linguistic competence from which they arise. Any linguistic skill is a candidate for a metalinguistic counterpart in development. The categories surveyed here are word awareness, syntax, and phonology. Finally, a discussion of the construct 'metalinguistic' attempts to establish the essential features that distinguish this ability and account for the pattern of development observed in bilingual children.

Word Awareness

Two related insights are required for children to appreciate the symbolic function of words. The first is awareness of the segmentational process that isolates words in utterances. Tasks assessing this aspect of word awareness typically ask children to count the number of words in a sentence or to define the concept 'word.' The second is awareness of the arbitrary relation between words and their designated meanings. Early on, Leopold (1961) identified the ability to recognize and appreciate this arbitrary basis of meaning in language as a direct benefit of bilingualism.

The segmentational ability that is part of word awareness has not been studied extensively in bilinguals. One study, however, has compared English and French monolingual and bilingual French-English children in this skill (Bialystok, 1986a). The children had to count the number of words in a sentence when the sentence appeared in its normal form or when the words in the sentence were scrambled to produce a meaningless string. Additionally, the sentence could consist of monosyllabic words or more complex words containing several syllables or several morphemes. The problems were relatively easy when the words were scrambled, although monosyllabic constructions were easier than the others. In contrast, the problems were very difficult when the sentences were left intact; on these items, there was a significant bilingual advantage for all word types. The presence of the meaning in the intact sentences interfered with children's ability to enumerate the units in the sentence, but monolinguals were disrupted more than the bilinguals.

Ben-Zeev (1977) developed a creative task to assess children's awareness of referential arbitrariness. In this task, called a symbol substitution task, children were asked to substitute random words for a common word in a sentence, creating nonsense. For example, children would be told to substitute *we* with the word *spaghetti*. Defying all sense, children had to produce such sentences as, "Spaghetti are good children." She found that Hebrew-English bilingual children were significantly more reliable in making this substitution than were Hebrew monolinguals. The monolingual children were more wedded to the familiar meanings of words than were their bilingual peers. It is as though the meaning is inherent in the word, an immutable property of it. In contrast, bilingual children were more willing to accept that the meaning of word was more convention than necessity; more agreement than truth, and felt free to break the agreement if they so chose. This is the same analysis that applies to children's performance of Piaget's (1929) famous sun-moon problem. Here, too, bilingual children were better than monolinguals in understanding that changing the names for the sun and moon did not change the condition of the sky during the day or at night (Bialystok, 1988; Cummins, 1978; Ricciardelli, 1992).

Children's understanding of the nature of reference has been investigated in other ways as well. Feldman and Shen (1971) taught groups of monolingual and Spanish-English bilingual children new names for things, where the new names were either the real names for other objects or nonsense words. Both groups of children learned the new names equally well, but only the bilinguals were successful in using the new or nonsense names in sentences. In other words, only the bilinguals accepted that the new names *could* be used arbitrarily in a real linguistic context. Similarly, Ianco-Worrall (1972) asked monolinguals and Afrikaans-English bilinguals about the viability of changing the names for known objects and only the bilinguals agreed names for things could be changed.

Cummins (1978) administered four types of metalinguistic tasks to bilinguals and monolinguals dealing with various aspects of word awareness. There were performance differences between the two groups on only some of the tasks, or on some parts of the tasks. For example, one task tested whether a child considered the meaning of a word to be stable even when the referenced object had ceased to exist, such as the continued existence of the word "giraffe" if there were no giraffes left in the world. This task showed a bilingual advantage, especially by the older children. In another task, children were asked whether particular words had the physical properties of the objects they represented, for example, "Is the word *book* made of paper?" Here there were no differences in performance between bilinguals and monolinguals. Cummins concluded that bilinguals had a greater linguistic flexibility but not a greater reasoning ability for problems that extended beyond the domain of language.

Ricciardelli (1992) compared the performance of first grade children who were either English monolinguals or Italian-English bilinguals on a battery of cognitive and metalinguistic tasks. There were five metalinguistic tasks assessing word awareness, syntactic awareness, and concepts of print. Although there were some weaknesses in aspects of the design and analyses, the results showed a bilingual advantage on the syntactic awareness task and one of the word awareness tasks.

The results of these studies do not always favor bilinguals. Rosenblum and Pinker (1983) found no differences between Hebrew-English bilinguals and English and Hebrew monolinguals in their ability to substitute a nonsense word for an actual word, but there were differences in their explanations. Monolingual children focused on the attributes of objects and explained that the name of an object, such as a table, could be changed to *shig* because it still had four legs. Bilingual children justified their answers in more abstract and general terms, explaining that the name of an object was arbitrary and could be changed under certain conditions.

A study by Edwards and Christophersen (1988) added an important dimension to these investigations by including the effects of literacy level. Bilingualism and literacy affected performance on the tasks in different ways. In a word segmentation task, higher levels of literacy were associated with higher task performance. Conversely, performance on two tasks assessing referential arbitrariness was significantly related to level of bilingualism. These tasks involved the familiar attempt to have children change the names for the sun and moon (and cats and dogs as well in this case) and to answer questions about the tangible properties of words, such as "Does the word *bird* fly in the sky?" At the same time, neither literacy nor bilingualism was related to children's ability to make simple grammaticality judgments.

Although many studies reported bilingual superiority in tasks assessing concept of word, there was no unconditional advantage for bilinguals on all tasks. The advantages were confined to certain tasks, and sometimes to certain parts of some tasks. It is not uncommon for studies employing a battery of tasks to report different results for each. Indeed, if one group consistently and uniformly outperformed the other irrespective of the task demands, it might signal an inherent difference between the groups, for example, differences in intelligence or language proficiency. The array of results requires us to examine the pattern closely to determine the conditions under which bilinguals express superiority.

Syntactic Awareness

The need to make a judgment about the grammatical acceptability of a sentence is probably the prototypical metalinguistic task. Nonetheless, there is some controversy about whether the standard version of this task (that is, judge the grammaticality of a simple sentence presented in one's native language) is metalinguistic at all. For Chomsky, at least, it is simply part of native speaker competence. Nonetheless, the paradigm is used frequently both as a measure of syntactic awareness and as an index of language proficiency.

These tasks have been used successfully with children. Galambos and Hakuta (1988) compared English-speaking monolinguals and Spanish-English bilinguals for their ability to solve two kinds of metalinguistic tasks. The first was a standard task in which children were asked to judge and then to correct the syntactic structure of sentences. The second asked children to determine the ambiguity in sentences and then to paraphrase the various interpretations. The research was conducted longitudinally and showed that bilingual children had a consistent advantage over monolinguals in the syntax task but only the older children (that is, the same children in the later testing session) were better than the monolinguals in the ambiguity task. They also report specific effects of the children's level of language proficiency and details of the task items. These are important constraints on the results—bilingual effects are not simple and not pervasive.

A more extensive study based on the same principles was conducted by Galambos and Goldin-Meadow (1990). They presented Spanish and English monolinguals and Spanish-English bilinguals with a range of problems assessing syntactic awareness. In a series of sentences, children were asked to note any errors, correct the errors, and explain the errors. These questions were considered to be ordered in terms of their demands from lowest to highest levels of awareness. The researchers found that noting and correcting errors were systematically related but claimed that explaining the errors was a qualitatively different skill from these. This bifurcation between the explanation condition and the other two tasks was recapitulated through the effects of the bilingual experience on performance. When noting and correcting errors, the bilinguals progressed faster than monolinguals and showed significant advantages at all ages tested. When explaining the errors, however, there were no compelling advantages for the bilingual children. Galambos and Goldin-Meadow (1990) interpreted the developmental progression as moving from a content-based to a structure-based understanding of language, arguing that bilingualism alters the rate of development but not its course.

Grammaticality judgment tasks have been manipulated to create more precise tools for investigating children's linguistic (and metalinguistic) competence. The manipulations can involve altering the detail of examination required (Galambos & Goldin-Meadow, 1990; Galambos & Hakuta, 1988) or the length or complexity of sentences in an effort to elicit judgments from younger children (de Villiers & de Villiers, 1974; Smith & Tager-Flusberg, 1982). Another kind of manipulation alters the attention needed to make the judgment by introducing misleading material. This manipulation was first used by de Villiers and de Villiers (1972) and developed into an experimental task to identify differences between judgments made by monolinguals and bilinguals by Bialystok and colleagues (Bialystok & Ryan, 1985).

In standard judgment tasks, subjects must decide whether or not there are grammatical violations in sentences. If the sentence also contains incorrect semantic information, then it is difficult for young children to ignore these errors and attend only to the well-formedness criteria. For example, children trained to judge only grammaticality can be given a sentence like "Apples grow on noses." This sentence is grammatically correct, but the semantic anomaly is highly distracting and children would like to say that the sentence is wrong. In repeated studies, it has been shown that bilingual children are better than monolinguals at ignoring this irrelevant information and identifying the sentence as correct (Bialystok, 1986b, 1988; Bialystok & Majumder, 1998; Cromdal, 1999). Again, there is a bilingual advantage on a specific metalinguistic task but not a global advantage over the paradigm.

As with word awareness, performance differences do not always favor bilinguals. Gathercole (1997) used a grammaticality judgment task to determine whether Spanish-English bilingual children could use syntactic cues to distinguish mass nouns (e.g., "water") from count nouns (e.g., "cups"). She found that older and more fluent bilinguals performed like monolinguals but that the younger and weaker bilinguals were less developed than monolinguals in solving these problems. In another study, Gathercole and Montes (1997) used a more traditional grammaticality judgment task to determine whether Spanish-English bilingual children could make appropriate decisions about sentences containing violations of *that*-trace. They found that monolinguals were better than bilinguals for both judging and correcting the sentences, but that the performance of the bilinguals was significantly influenced by the amount of English input they received at home.

This research identifies some areas in which bilinguals do *as well* as monolinguals, but none in which they do better.

Phonological Awareness

Phonological awareness, the understanding of the sound units that make up words, is unique among metalinguistic skills in its consequence. Numerous studies have demonstrated a causal link between this metalinguistic achievement and progress in learning to read, at least for alphabetic scripts. Only a few studies, however, have examined the development of phonological awareness in bilingual children.

Rubin and Turner (1989) compared the phonological awareness of English-speaking first-grade children who were either in French immersion (giving them a modest command of French) or English programs and found an advantage for the French immersion children. A similar study by Bruck and Genesee (1995) using a larger test battery and more careful controls largely replicated the results for kindergarten children but found no advantage by grade one. Examining children whose bilingualism was even more limited, Yelland, Pollard, and Mercuri (1993) asked children to judge whether pictured objects had long names or short names. They also found an advantage for bilinguals in kindergarten that disappeared by end of grade one.

In a study by Campbell and Sais (1995), preschool (5-year-old) children who were monolingual or Italian-English bilinguals were compared on four tasks: detect a mismatch in initial sound of a set of words, detect a mismatch in meaning, delete morphemes from words, and identify letters. The bilingual children scored higher than the monolinguals on the first three tasks but the two groups were the same on the letter identification task, a pattern that Campbell and Sais interpreted as indicating an advantage in metalinguistic but not linguistic knowledge. However, these tasks are only questionably phonological and the children were only tested in preschool. In other studies, preschool advantages disappeared in first grade.

Phonological awareness is important because of its relation to the acquisition of literacy. Carlisle, Beeman, Davis, and Spharim (1999) gave Hispanic bilinguals in grades one to three two different tasks in both languages. One was a definition task and the other was a phonological awareness task. For this measure, children had to say parts of words, for example, "Say *mean* without the /m/." Regression analyses showed that reading proficiency was related to vocabulary size in both languages and to level of phonological awareness. However, vocabulary size and phonological awareness were correlated only in the language in which children were learning to read, namely, English. Another factor influencing these relations is the script in which the language is written. Rickard Liow and Poon (1998) showed that bilingual children who could read both Chinese characters and an alphabetic language with a shallow orthography (that is, one with relatively regular sound-symbol correspondence), Indonesian, performed better in phonological awareness and spelling than did bilingual children who could read both Chinese characters and an alphabetic language with a deep orthography (one with less regular sound-symbol relationships), English. The regular sound-symbol correspondences in Indonesian helped these children to work out the nature of phonological structure, even for other languages.

We conducted a series of studies to explore the development of phonological awareness in monolingual and bilingual children across a range of age and tasks (Bialystok, Majumder, & Martin, 2000). In the first two studies, children were five, six, and seven years old (corresponding to kindergarten, first grade, and second grade). The bilingual children were (about equally) fluent in English and French. The task, called phoneme substitution, was a difficult problem in which children needed to replace the first sound in a target word with the first sound from another word to produce a new word. For example, "cat" can be converted to "mat" by substituting the first sound of "mop." Children were told, "Take away the first sound from "cat" and put in the first sound from "mop." What is the new word?" There were no differences between the monolinguals and the bilinguals in their ability to solve this problem.

The third study included a wider range of groups and a larger selection of tasks. Children were again five, six, and seven years old and were monolingual or bilingual with either Spanish or Chinese as their other language. The three tasks were different in the demands they made on explicit phonological awareness and the involvement of other cognitive components in their solution. There were bilingual differences on only one task and for one group—the Spanish-English bilinguals solved a phoneme segmentation task better than monolinguals or Chinese-English bilinguals did. Hence there is some advantage to bilingual children in learning about the sound structure of spoken language, but it is evident only on relatively simple tasks and apparent only for children whose two languages bear some resemblance to each other. Although reliable advantages for bilingual children can be established, they are heavily constrained by other factors.

Extracting the Pattern

The group comparisons provided little ground for claiming a consistent core to the tasks described as metalinguistic. Bilingual and monolingual children acquired aspects of these concepts on different schedules, even undermining any consistency in the subcategories of linguistic competence. Therefore, instead of defining "metalinguistic" in structural terms by pointing to a set of tasks that indicate the ability, it will be considered in processing terms, identifying the cognitive components that are implicated in the solution to specific metalinguistic tasks.

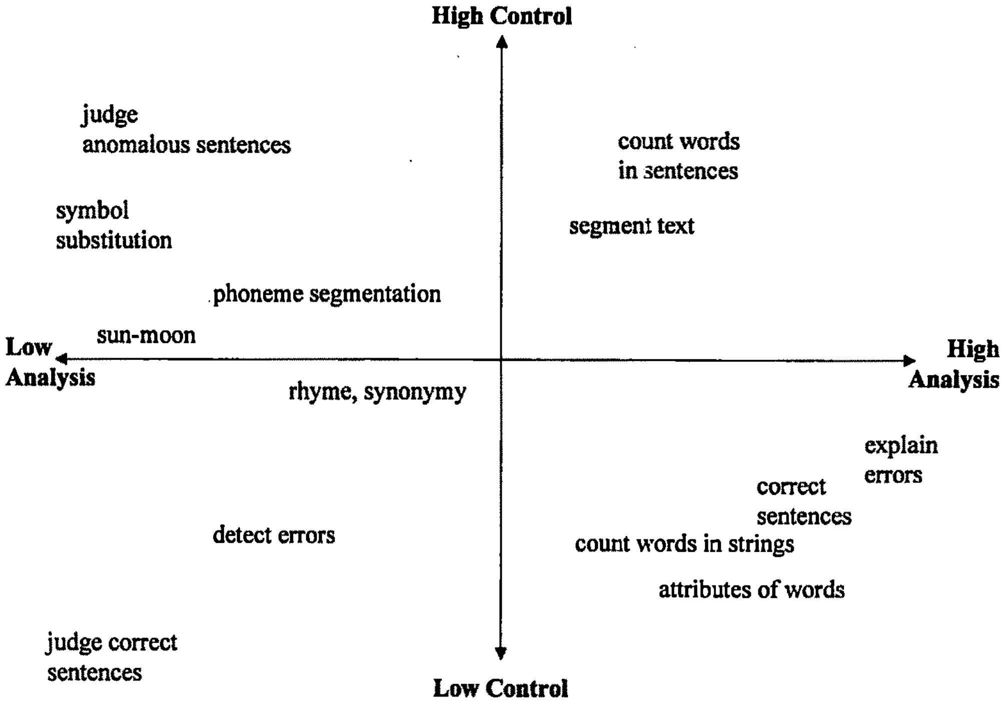
The processing description, elaborated elsewhere (Bialystok, 1993, in press), is based on two cognitive processes that are implicated in language acquisition and other cognitive developments. These processes are called analysis of representational structures and control of selective attention. Greater involvement of each makes tasks more difficult, and this difficulty results in behavior appearing to be increasingly metalinguistic. However, no specific boundary in the development of either process signals a category shift into metalinguistic performance; it is a gradual transition into a continuously evolving domain.

The first process, analysis of representational structures, is children's ability to construct mental representations with more detail and structure than was part of their initially implicit knowledge. Representations that are more explicit are more amenable to conscious access and to intentional manipulation. Karmiloff-Smith (1992) articulates a theory in which representational redescription is the central mechanism for cognitive development. Although not identical to the process of analysis, there is much common ground in the two descriptions. This processing component captures the need for metalinguistic behavior to be based on knowledge that is more explicit or more formal than that needed for more ordinary linguistic performance.

The second process, control of attention, is responsible for directing attention to specific aspects of either a stimulus field or a mental representation as problems are solved in real time. The need for control is most apparent when a problem contains conflict or ambiguity and the correct solution requires attending to one of two plausible representations and inhibiting or resisting attention to the other. Tipper and McLaren (1990) have identified this development of inhibition as one of the crucial advances in attention. Problems that present greater degrees of conflict require higher levels of control of attention. These problems also elicit performance that is more metalinguistic.

Defined in terms of underlying processes, any task that places high demands on these processes is metalinguistic. This processing criterion allows different metalinguistic tasks to be compared in more detail. A selection of some metalinguistic tasks with their processing demands is illustrated in Figure 1.

Figure 1: Some metalinguistic tasks with an estimate of their demands for analysis and control.



This processing framework provides a means for re-interpreting the results of monolingual and bilingual comparisons of metalinguistic development. Simply put, tasks that are high in their demands for control of attention are solved better by bilinguals than monolinguals; tasks that are high in their demands for analysis of representations are not necessarily solved better by either group. The bilingual advantage, therefore, is in the ability to control attention when there is misleading information.

Consider some of the tasks used in the research described in this review. The following tasks produced an advantage for bilingual children: count words in sentences, symbol substitution, sun-moon problem, use novel names in sentences, word-referent problem ("giraffes"), judge grammaticality of anomalous sentences, and phoneme segmentation. The following tasks did not produce a bilingual advantage: count words in strings, describe attributes of words, determine ambiguity, explain grammatical errors, judge grammaticality of incorrect (but meaningful) sentences, understand count-mass distinction, and phoneme substitution. The difference is in the primary demands imposed by each set of tasks. The tasks in the former group include misleading information, making them high in their demand for control of attention. The tasks in the latter group require detailed knowledge, making them high in their demand for analysis of representations. The effect of bilingualism on children's development is that it enhances their ability to attend to relevant information in the presence of misleading distractions. There is no domain description that defines this bilingual advantage: some metalinguistic tasks are solved better by bilinguals and others are not. Even the subcategories of word awareness, syntactic awareness, and phonological awareness do not capture what is unique about the access to these problems by bilingual children. It is only at the level of underlying processing that the pattern becomes clear.

The conclusion from this interpretation is that bilingual children do not have different control over a domain of knowledge than monolinguals. Specifically, there is no evidence that metalinguistic ability *per se* is developed more easily or more quickly in bilingual children. It is the case, nonetheless, that bilingual children consistently outperform monolinguals on some metalinguistic tasks. Rather than attributing this advantage to privileged access to a domain of knowledge, however, the benefit is traced to a specific cognitive process that develops more readily in bilingual children. This process, control of attention, is central to certain metalinguistic problems, and it is in solving these problems that bilingual children excel. Although this analysis leaves little ground for claiming a bilingual superiority in an important developmental ability, it isolates nonetheless a formidable advantage in cognitive processing. The potential impact of this cognitive process goes well beyond the domain of metalinguistic, or even linguistic competence.

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11. THE DEVELOPMENT OF BASIC READING SKILLS IN CHILDREN: A CROSS-LANGUAGE PERSPECTIVE

Esther Geva and Min Wang

This chapter reviews recent empirical evidence for universal and orthography- or language-specific processes in the development of basic reading skills in school age children, suggesting that universal and orthography- or language-specific processes should be considered in tandem. The review focuses on three different aspects of reading, phonological processing, rapid naming, and morphosyntactic complexity, targeted in recent research on development of word recognition skills. Studies on L1 school children and studies of children who learn to read concurrently in their L1 and/or in a second language (L2) are examined within the context of variations in orthographic transparency. When children learn to read, characteristics of the spoken language interact with characteristics of the orthography. The chapter concludes that (a) individual differences in phonological processing skills, verbal memory, and rapid naming predict the development of reading in L1 and L2 children in various alphabetic and nonalphabetic languages; and (b) individual differences on such prerequisite skills can indicate smooth or problematic acquisition of L2 reading skills in children, regardless of oral language proficiency. However, task demands associated with learning to read in different orthographies vary and yield steeper or more moderate learning slopes. Regardless of the language and orthography combinations under study, children can develop reading strategies that help them read.

Writing systems can be classified into two categories—morphography (or logography), used in languages such as Chinese and Japanese, and phonography (or phonetic script), used in languages such as English and Russian (Koda, 1989; Leong & Tamaoka, 1998). Some researchers argue that visual, phonological, and morphosyntactic differences involve different demands on word recognition processes in different languages (Chen, 1992; Feldman, 1987; Frost & Bentin, 1992; Henderson, 1982; Koda, 1989; Leong & Tamaoka, 1998; Shimron, 1993; Taylor & Taylor, 1983; Tzeng & Wang, 1983). With regard to alphabetic languages, the "orthographic depth hypothesis" (Feldman & Turvey, 1983; Katz & Frost, 1992) has been used as a framework for discussing differences in word recognition processes. It has been argued that prelexical phonology plays a more important role in reading words in "shallow" or "transparent" orthographies, such as Spanish or German, that have a direct and consistent grapheme to phoneme correspondence, than in "deep" or "opaque" orthographies, such as English, where the mapping of letters to sounds is less consistent. More recent research suggests that this framework can be extended to nonalphabetic writing systems such as Chinese (e.g., Hu & Catts, 1998; Leong & Tamaoka, 1998; Shu & Anderson, 1997; Tan & Perfetti, 1998).

In recent years researchers have turned their attention to the study of the acquisition of basic reading skills in different languages and different orthographies. One cluster of studies involves investigations of word recognition processes in alphabetic languages other than English. These studies seek to understand how cross-linguistic differences at the level of the spoken word (e.g., syllable structure, the availability of specific phonemes, the structure of syllable onset, morphemic density) interact with differences in orthographic depth in the acquisition of word recognition skills. Another cluster involves the study of word recognition processes in nonalphabetic orthographies. Two theoretical positions underlie these research trends, one focusing on cross-orthography and cross-linguistic commonalities in the reading acquisition process, and one seeking to understand the impact of differences in linguistic structures and writing systems on the acquisition of basic reading skills. Some of this research literature has focused on adults learning to read in a second language (L2) (Akamatsu, 1999; Jackson, Chen, Ewald, Goldsberry, Kim, & Vanderwerff, 1999; Koda, 1999; Nassaji & Geva, 1999; Tan & Perfetti, 1998; Wade-Woolley, 1999).

Cross-orthography research on the reading acquisition process in children is a more recent phenomenon. Some cross-linguistic studies compare how elements in the oral language and underlying cognitive processes enable or hinder children's mastery of specific word recognition and spelling skills. Other studies focus on specific elements in the writing system or in the oral language that might facilitate or impede this development. The objective of the present chapter is to review recent experimental research evidence for universal and orthography- or language-specific processes in studies on reading development in school-age children. The review focuses on three clusters of component processes, phonological processing skills, rapid automatized naming, and morphosyntactic complexity, whose role in word recognition processes in children has been targeted in recent years.[1] The chapter includes studies comparing children speaking different languages learning to read in their first language (L1) and studies concerned with children learning to read concurrently in their L1 and/or in an L2. The review consists of two main parts. The first part focuses on research where children learning to read in different L1s are compared. Discussion of studies supporting universal notions is followed by discussion of studies providing evidence for language- or orthography-specific processes. The second part focuses on studies concerned with bilingual or L2 children. Here too, studies providing support for universal principles are described, followed by studies supporting language- and orthography-specific trends.

L1-Based Cross-Linguistic and Cross-Orthography Research in Children

Evidence for Universal Principles

Phonological processing. An extensive body of research literature on L1 reading skills development has shown that learning to read requires mastering the system by which print encodes oral language (Adams, 1990; Stanovich & Siegel, 1994). This mastery involves a variety of related skills such as establishing letter-name knowledge (Chall, 1996; Ehri, 1991) and various phonological processing skills (Adams, 1990; Wagner, Torgesen, & Rashotte, 1994). Phonological processing skills are typically assessed by measuring how individuals can conceptualize and manipulate sublexical elements (e.g., phonemes, syllables, onsets, and rimes) by deleting, counting, segmenting, or substituting elements (Shankweiler, 1999; Stanovich, 1993; Yopp, 1988). Various aspects of phonological processing assessed prior to the onset of formal reading instruction predict later reading achievement (Ehri, 1998; Elbro, 1996; Shankweiler, 1999; Torgesen, 1999). Deficits in the representation, retrieval, or analysis of phonological information are associated with persistent problems in the acquisition of word identification and decoding skills (Adams, 1990; Elbro, Borstrom, & Peterson, 1998; Shankweiler, 1999; Snowling, 1995; Stanovich, 2000; Stanovich & Siegel, 1994; Swan & Goswami, 1997; Torgeson, 1999). In addition, there is a reasonable agreement among researchers that over time the relationships between phonological processing and reading are mutually enhancing (e.g., Goswami & Bryant, 1990; Morais, Alegria, & Content, 1987; Wagner, Torgersen, & Rashotte, 1994).

Some research with children also suggests that the role of phonological processing skills in learning to read may be universal. Cross-orthography comparisons (e.g., Czech-English; Turkish-English; French-English) show that phonological awareness skills are important in learning to read in various alphabetic languages (Caravalos & Bruck, 1993; Durgunoglu & Oney, 1999; Oney, Peter, & Katz, 1997; Sprenger-Charolles, Siegel, & Bonnet, 1998, respectively). For example, in a study comparing Turkish and American 5–7 year old children, Durgunoglu and Oney (1999) replicated the finding reported consistently in the research literature that the ability to segment and delete phonemes in words is important for word recognition accuracy in Turkish and English. They found that knowledge of letter names and awareness of phonological units correlated with the ability of prereaders in both countries to decode words. Moreover, in both language groups children in grade one performed better on the phonological awareness tasks than children in senior kindergarten.

Relevance in nonalphabetic languages. Until recently, phonological information was considered less important in reading in nonalphabetic languages such as Chinese. This view was based largely on the assumption that Chinese orthography is a "deep" orthography with little correspondence between sound and symbol. Learning to read Chinese or Japanese characters was thought to be achieved primarily by visual memory and direct linkage of orthographic with semantic information. However, there is now strong evidence for generalized phonological activation not only in alphabetic languages but also in other writing systems.[2] Research has shown that early phonological skills are useful in predicting accurate word recognition in Chinese primary level children (Ho & Bryant, 1997a, b, c; Hu & Catts, 1998; McBride-Chang & Ho, 2000; Shu, Anderson, & Wu, 2000).[3] Ho and Bryant examined the development of phonological awareness of Chinese children and its relationship with their success in reading. They found that Chinese children, like English-speaking children, are able to detect relatively large sound segments (e.g., partial homophones) when they begin to acquire reading skills and that they gradually develop the ability to manipulate smaller units (e.g., rhymes and tones) (Ho & Bryant, 1997a). However, cross-linguistic comparisons indicate that Chinese children develop an awareness of initial consonants and rhymes later than their English-speaking counterparts. In other words, differences in oral and written language features of Chinese and English impact children's rate of development of phonological awareness differentially. In another study, Ho and Bryant (1997c) found that prereading phonological skills predicted children's reading performance in Chinese significantly two and three years later, even after controlling for the effects of age, IQ, and mother's education. The authors suggest that the main reason for this relationship is that phonological knowledge helps children to use the phonetic components in Chinese characters.

Support for universal aspects of reading development has also come from studies on dyslexic Chinese children. Early problems with phonological awareness in children are seen as reflecting less sharp phoneme boundaries in speech perception (Fowler, 1991), or less distinct phonological word representations (Elbro, Borstrom, & Peterson, 1998). Some studies demonstrated the utility of training dyslexic children in various aspects of phonological processing skills (Bradley & Bryant, 1983; Lundberg, Frost, & Petersen, 1988). Dyslexic Chinese children have been shown to have deficits in processing phonological information just like their counterparts who learn to read in alphabetic languages (Ho, Law, & Ng, 1998; So & Siegel, 1997). Interestingly, in a recent study Ho and Ma (1999) demonstrated that training in phonological strategies is effective in improving dyslexic Chinese children's reading performance, as well.

Evidence for Linguistic- or Orthography-Specific Principles in Children's L1

Phonological processing. The fact that well developed phonological processing skills are implicated in the development of word recognition skills in different orthographies does not mean that developmental trajectories and sub-lexical processes associated with word recognition skills are identical across orthographies. This may be so because languages differ in degrees of transparency of the relations between the phonology and the orthography, and the fact that in some languages, such as Spanish and voweled Hebrew, the relation between phonemes and graphemes is much more predictable than in languages such as French and English. Treiman, Mullennix, Bijeljac-Babic, and Richmond-Welty (1995) studied the relations between spellings and sounds in C_1VC_2 words in English. They found that in English orthographic units consisting of the vowel and the final VC_2 units (i.e., rimes) had more stable pronunciations and were therefore more predictable than individual vowels or C_1V clusters. Treiman et al. maintain that the characteristics of English orthography encourage readers to use onset-rime word parsing. Based on a similar study, Peerman and Content (1997) report that in French, paying attention to rimes as well as to C_1V units enhances reading accuracy and is more conducive to accurate pronunciation of words than paying attention to individual grapheme-phoneme combinations.

Goswami, Gombert, and De Barrera (1998) conducted a series of experiments to compare the development of orthographic representation in children ranging in age from 7-9, all learning to read in their L1 (English, French, or Spanish). The researchers used three different types of pseudowords: (a) those that shared orthographic and phonological features with real words at the level of the rime (e.g., *cake-dake*); (b) those that shared only phonological features (e.g., *cake-daik*); or (c) pseudowords whose rime units could not be read on the basis of analogies with real words at the phonological or orthographic level (e.g., *faish, ricop*). Children learning to read French or English were more accurate and faster when they read items such as *dake* or *daik,* where they could rely on familiarity with phonological and/or orthographic units, than when they had to read pseudowords such as *ricop*, where they could not rely on large-unit analogies with real words. The researchers conclude that children who learn to read in less transparent orthographies such as English and French are more likely to benefit from processing large orthographic units such as rimes than children who learn to read in highly transparent orthographies such as Spanish. They suggest that for children who learn to read in a highly transparent orthography, "reliance on a letter-by-letter decoding is the most efficient reading strategy" (p. 46). This strategy may lead children reading Spanish to read more slowly, but because of the high grapheme-phoneme consistency in Spanish, children can begin to read with high accuracy earlier than children learning to read French or English. On the other hand, the task facing children whose L1 is French or English is more formidable. When the pseudowords can be read on the basis of analogies with real words, their reading accuracy is enhanced. However, when they cannot rely on analogies with real word rimes, their error rates are higher than when they can rely on familiar orthographic and/or phonological elements. It should be noted that Spanish-speaking children may also rely on rime analogies, because reliance on rimes is probably an automatic process. However, because of the transparent nature of Spanish orthography, the grapheme-phoneme codes are mastered more easily by children learning to read Spanish than by children learning to read English or French.

Frith, Wimmer, and Landerl (1998) investigated word and pseudoword reading in German and English speaking 7- to 12-year-old children. At ages 7–9, English-speaking children made a higher proportion of errors than their German-speaking counterparts when reading pseudowords or words with low frequency. By age 12, both groups had equally fast decoding latencies of correctly read pseudowords, but English-speaking readers were still less accurate when decoding long and complex pseudowords. Vowels, which are the most inconsistent feature of English orthography, were often mispronounced in English, but hardly ever in German, where vowel pronunciation is consistent. In addition, word substitution errors occurred more frequently in English-speaking than in German-speaking children. This study suggests that because of low orthographic consistency children learning to read English tend to use complex and error-prone strategies in phonological recoding, whereas children learning to read in highly transparent languages such as German can carry out phonological recoding in an "on-line" fashion.

Some researchers argue that it is not rimes but other linguistic processes which help or hinder the acquisition of word recognition skill. Based on results of a longitudinal study of kindergarten children, Sprenger-Charolles, Siegel, and Bonnet (1998) challenge the argument that French-speaking children rely on word analogies in early stages of learning to read. They did not find strong evidence for early use of analogies either in spelling or in reading. Instead, they found a strong reliance on grapheme-phoneme-correspondence strategies. They argue that the difference between languages at the sub-lexical level interacts with word recognition processes, maintaining that, unlike English, French syllables tend to be open, and the pronunciation of vowels is therefore not constrained by the graphemic environment. This feature of spoken and written French means that spelling-sound correspondences in French are not more predictable at the rime level than at the grapheme-phoneme-correspondence level. For this reason, they argue, grapheme-phoneme-correspondences in French are largely predictable, though perhaps not as predictable as Spanish, Italian, or German.

Rapid automatized naming. It is generally found that poor readers have a deficit in naming speed as assessed by rapid automatized naming tasks. For example, Manis, Seidenberg, and Doi (1999) demonstrated in their computational model that rapid automatized naming accounts for independent, distinct variance in predicting reading performance over and above phonemic awareness. Using a task called "rapid automatized naming" or RAN (Denckla & Rudel, 1976), researchers have shown that speed of naming objects, colors, and letters differentiates good and poor readers.

Yet there is some disagreement as to the extent to which rapid automatized naming is an aspect of phonological processing or is distinct from phonological processes. Researchers working within the phonological core deficit framework characterize poor readers as having deficits in various aspects of phonological processing such as phonological awareness, phonological coding in working memory, and the retrieval of phonological codes from long-term memory (Wagner & Torgesen, 1987; Wagner, Torgesen, & Rashotte, 1994; Wagner et al. 1997). They argue that poor readers' deficit in rapid naming reflects an inability to retrieve phonological codes from a long-term store. Wagner et al. (1997) explain that with increasing skill and practice beginner readers become more fluent and their word recognition skills become automatized, resulting in a decrease in variability in naming speed and therefore in a decrease in the role of rapid automatized naming in explaining variance in word recognition. On the other hand, researchers such as Bowers and Wolf and their colleagues (Bowers & Wolf, 1993; Bowers, Sunseth, & Golden, 1999; Wolf & Bowers, 1999) acknowledge the importance of phonological processes in word recognition, but argue that slow naming speed is also an important characteristic of some poor readers; further, they held that this deficit does not arise from deficient phonological processing, but from a dysfunction in the precise timing mechanism necessary for establishing unitized orthographic and phonological codes from visual input. These researchers proposed the "double deficit hypothesis," according to which some readers are poor at phonological processing, others are primarily poor in naming speed, and some have a deficit in phonological processing as well as in naming speed.

Very little cross-linguistic research is available on direct comparisons of rapid naming in different languages. However, research on Dutch (de Jong & van der Leij, 1999) and German children (Wimmer, Mayringer, & Landerl, in press) suggests that rapid naming may play a more prominent role than phonological awareness in explaining and predicting individual differences in children who learn to read shallow orthographies. For example, in a recent longitudinal study of German L1 children, Wimmer et al. (2000) found that early, single naming-speed deficit measured at the beginning of Grade 1 was predictive of reading fluency at the end of Grade 3. This finding is consistent with the finding that dyslexic German children (whose primary problem is reading fluency and not reading accuracy) exhibit naming-speed deficits, but very few phonological awareness deficits (Wimmer, Mayringer, & Landerl, 1998; Wolf, Pfeil, Lotz, & Biddle, 1994). These results suggest that the relative role played by rapid naming and indices of early phonological awareness might differ across orthographies which differ in complexity. (It is yet not clear whether such differences may be related also to different approaches to reading instruction in the early grades.)

In the only cross-orthography study focusing on rapid naming available so far, Frith et al. (1998) found significant differences in word and pseudoword naming latencies between German-speaking and English-speaking children at age 8. In general, German-speaking children responded faster than English-speaking children. On short, one- and two-syllable items, the increase in reaction time from real words to pseudowords as well as from high- to low-frequency words was smaller for the German-speaking children than for the English-speaking children. On longer three-syllable items, English-speaking children performed more slowly than German-speaking children. Both language groups took more time to read long pseudowords than to read long real words. However, at age 12, there were no differences in naming latencies between the German- and English-speaking children. In other words, once children have become fluent and efficient readers, cross-linguistic differences in naming latencies for similar items disappear. This research demonstrates how differences in orthographic depth yield different trajectories associated with the development of efficient reading skills.

Morphosyntactic processing. Very little research is available on the impact of morphosyntactic aspects on word recognition in different writing systems. The available research on processing morphosyntactic information embedded in words suggests that it is also important to study the complex way by which single-morpheme words can be transformed by language users on the basis of language-specific morphological and syntactic rules to form more complex "words" (Ben-Dror, Bentin, & Frost, 1995). This research indicates that the processes associated with word recognition may differ across languages not only as a function of the degree to which the phonology can be easily recoverable from the orthography, but also as a function of the nature and degree of complexity involved in "unpacking" words into their morphosyntactic constituents (Geva, 1999). Words in different orthographies vary in terms of morphosyntactic complexity. French is an example of a language where the orthography provides more morphological information than is available in the spoken language. For example, plurals are typically marked with the letter "s" added to the nouns, but the phoneme /s/ is typically not pronounced. The requirement to consider "silent" morphological elements in word spellings adds additional complexity to spelling. Senechal (in press) compared French primary school children's spelling of single morphome words with silent-consonant endings (e.g., *chat*) with spellings of more complex silent consonants. Children's sensitivity to the morphological information was examined. Children in grades two and four were tested on three categories of words: (a) regular words which do not include any silent letters; (b) "morphological" words where the final consonant could be deduced by using derivatives (e.g., *gentil, blanc*); and (c) "deep" words where there are no derivatives to indicate the consonants, so the silent consonant endings must be memorized (e.g., *prix, tabac*). Results showed that children spelled regular words best, and morphological words better than the "deep" words.

The contribution of higher order morphosyntactic processes to word recognition may be more central in the development of word recognition skills in highly inflected languages such as French, Dutch, Hebrew, or Arabic. These languages may be relatively "transparent" orthographically, but morphosyntactically "deep" (Geva, Wade-Woolley, & Shany, 1997). Other languages, such as Chinese, can be characterized as orthographically "deep" but morphosyntactically "transparent." For example, Chinese "words" do not have to be unpacked to uncover grammatical elements that indicate number, gender, tense, or degree (Li & Thompson, 1981; Hoosain, 1991). Based on research on reading processes in a study of elementary school Hebrew-speaking children, Shimron (1999) suggests that perhaps in some languages skilled readers may be more tuned to semantic and syntactic sources of information, and that perhaps in some languages semantic/syntactic "word" decomposition takes place "en route to word recognition" (p. 317). In this vein, Assink and Kattenberg (1994) have shown that the ability of Dutch children to integrate syntactic information with spelling accuracy increases gradually with age, and that higher order oral language processes contribute to orthographic knowledge.[4]

L2 and Bilingual Cross-Linguistic and Cross-Orthography Research

Evidence for Universal Principles

Phonological processing. Of the various aspects of phonological processing skills studied in the L1-based research literature, one aspect, phonological awareness, has received considerable attention in the research on second language (L2) or bilingual learners. Research focusing on normally achieving bilingual children (Bruck & Genesee, 1995; Cisero & Royer, 1995; Comeau, Cormier, Grandmaison, & Lacroix, 1999; Geva, 2000a; Geva, Wade-Woolley, & Shanny, 1993; Sénéchal, 2000; Wade-Woolley & Geva, 2000) shows that phonological awareness skills in L1 and L2 correlate with each other, transfer cross-linguistically, and can predict word recognition and spelling development in children's L1 and L2. For example, Comeau et al. (1999) provided evidence for cross-language transfer of phonological awareness and its impact on word decoding. In their study of Anglophone children in a French immersion program, phonological awareness in English, the L1, was as strongly related to word decoding in L1 as was phonological awareness in French, the L2; likewise, phonological awareness in the L2 was as strongly related to word decoding in the L2 as was phonological awareness in the L1.

Research focusing on children learning to read in L2 (Comeau et al., 1999; Durgunoglu, Hancin-Bhatt, & Nagy, 1993; Geva, Yaghoub-Zadeh, & Schuster, 2000; Gottardo, Yaz, Siegel, & Wade-Woolley, 2000; Wade-Woolley & Siegel, 1997) shows that phonological awareness skills can be measured reliably in the L2, and that individual differences in phonological awareness measured in the L1 or the L2 predict individual differences in the development of accurate word recognition and word decoding in the L2. In a study involving ESL children with Punjabi as L1, Chiappe and Siegel (1999) demonstrated that both phonological awareness and phonological recoding discriminated between good and poor readers. Similarly, Wade-Woolley and Siegel (1997) found that phonological processing (measured with phonological decoding and phoneme deletion tasks) predict L1 and ESL children's English spelling performance. In another study involving L1 and L2 reading development, Gottardo et al. (2000) administered parallel measures of phonological, syntactic, and orthographic processing skills and reading to English as L1 children and ESL children whose L1 is Cantonese. They too found that, in spite of differences in orthography, phonological skills were correlated across L1 and L2, and phonological skills in both L1 and L2 were correlated with L2 reading. Moreover, individual differences in phonological skill in L1 and L2 explained individual differences in reading in the L2, even though Cantonese is not an alphabetic orthography while English is. This research adds to a growing body of evidence for cross-language transfer of phonological processing.

The results of this line of research are especially noteworthy because of the strong belief among educators that oral language proficiency drives the development of word recognition skills in L2 (Geva, 2000b). This belief is supported with regard to reading comprehension (Geva & Petrulis-Wright, 2000; Geva & Ryan, 1993; Verhoeven, 2000). However, evidence coming from the studies noted above, as well as from studies focusing on children learning to read concurrently in their L1 and L2 (Durgunoglu et al., 1993; Geva & Siegel, 2000; Gholomain & Geva, 1999) shows that well developed phonological processing skills help children to read and spell in the L2, and that general linguistic proficiency in the L2 is only marginally related to accurate word recognition and decoding skills in the L2.

Rapid automatized naming. Another emerging strand of research exploring universal processes in learning to read focuses on the role of individual differences in rapid automatized naming in explaining individual differences in basic reading processes of children learning to read concurrently in two languages, as well as children learning to read in L2. Second language learners are less proficient in the L2, so it is reasonable to expect that they may be slower at naming speed tasks than their L1 counterparts. At the same time, just as individual differences in naming speed predict reading in L1, individual differences in naming speed in L2 learners predict reading in L2. For example, in a longitudinal study, Geva et al. (2000) compared precursors of word recognition skills in 6– to 8-year-old ESL children and children learning to read in English, their L1. Results indicated that vocabulary knowledge, a measure of language proficiency, was not a significant predictor of word recognition in English. Yet phonological awareness and rapid naming explained a substantial amount of variance on word recognition in English in both groups.

Another study involving bilingual Farsi-English primary level children (Gholamain & Geva, 1999) has shown that rapid naming predicted accurate word and pseudoword reading within and across-languages in grade 1–5 English-Farsi bilingual children. In that study, rapid naming of letters and colors in Farsi significantly predicted performance on the English reading tasks, and conversely, rapid naming of letters and colors in English significantly predicted word-based reading tasks in Farsi. Likewise, Geva (2000a) examined the contribution of phonological processing skills and rapid automatized naming within a longitudinal framework to performance on basic reading skills of bilingual English-Hebrew children in Grades 1 and 2. In that study, phonological processing and rapid naming were significant predictors in both languages. However, phonological processing played a more prominent role in English, the L1, while rapid automatized naming played a more prominent role in Hebrew, the L2. This pattern of results, as well as the fact that children's basic reading skills were more accurate in Hebrew, a language with a shallow orthography, suggest that the universalist/transfer and orthography-specific frameworks should be considered in tandem, and that sources of individual differences such as phonological processing and naming speed interact with orthographic complexity and exert a different influence on reading acquisition in different languages. Note that this conclusion echoes the one reached by Frith et al. (1998) with regard to German children. At the same time, these studies of ESL and bilingual children suggest that, even in the absence of L2 proficiency, it is possible to reliably measure naming speed; they further imply that performance on naming tasks in the L2 may be a rather sensitive index of individual differences in word recognition, not only in the L2 but also in the L1, probably because in the weaker language children are less likely to have reached automaticity.

Evidence for Language- or Orthography-Specific Principles in L2 Learners

Phonological processing. Interest in studies focusing on the role of specific phonological processing skills in learning to read in different L2s is a rather recent phenomenon. As noted earlier, evidence suggests that phonological awareness skills measured in L1 and L2 correlate with each other and can predict word recognition and spelling development in children's L1 and L2. For example, Geva (2000a) examined the extent to which similar processing demands (phonological awareness, rapid naming) might underlie correlations between parallel first language (English) and second language (Hebrew) decoding and word recognition skills within a longitudinal framework. Both phonological processing and rapid naming were significant predictors of word recognition and pseudoword reading. However, phonological processing played a more prominent role in English, the L1, and rapid naming played a more prominent role in Hebrew, the L2. Geva suggests that perhaps phonological processing skills are relevant for a shorter period when children begin to learn to read in a transparent orthography, such as voweled Hebrew, than when they learn to read in a more opaque writing system such as English.

Languages vary in the linguistic units that are salient and these may affect the pattern of development in phonological awareness (Caravalos & Bruck, 1993). One study relevant here was conducted by Durgunoglu and Oney (1999) who asked how Turkish children's understanding of the internal structure of spoken words might be influenced by two factors: (a) aspects of phonetic complexity at the syllabic level; and (b) changes to the internal structure of spoken Turkish words as a result of the requirement to attend to vowel harmony restrictions typical of

Turkish. Vowel harmony restrictions in Turkish require language users to constantly monitor subword linguistic units. Turkish words are also made more complex morphemically due to "post-inflections." Based on comparisons of American and Turkish first grade children, Durgunoglu and Oney conclude that cross-linguistic differences in development of phonological awareness in young children reflect the characteristics of such spoken language parameters.

The rate of acquisition of basic reading skills in L2 or bilingual children is not identical across different orthographies, and there is evidence to suggest that it may be affected by differences in orthographic "depth" (Frith et al. 1998; Geva & Siegel, 2000; Geva et al. 1993; Gholamain & Geva, 1999). For example, in three separate studies focusing on children with English as L1, Geva and her colleagues (Geva & Siegel, 2000; Geva et al. 1993, 1997) found that word recognition and pseudoword decoding skills in L1 (English) and L2 (Hebrew) were highly correlated, but that contrary to what might be expected, accuracy rate was higher in Hebrew, the L2. Moreover, children's error patterns in English and Hebrew were orthography-specific. The authors maintain that these differences reflect the fact that decoding voweled Hebrew can be executed in a linear manner, while English cannot (Katz & Frost, 1992).

Evidence for L1-specific influence has been noted not only with regard to the effect of orthographic depth on the development of decoding and word recognition accuracy but at an intra-word, micro level. For example, it is productive to examine at a micro-linguistic level the role that the availability or absence of specific phonological representations in the learners' L1 might play in the acquisition of specific elements in the L2. A recent example of this approach comes from a study by Wang and Geva (1999) who studied spelling development in Chinese ESL children. They focused on the spelling of words containing the phonemes /ʃ/ and /θ/ that do not appear in Chinese phonology. On an auditory discrimination task, 6- to 7-year-old Chinese ESL children had trouble in discriminating the phoneme "th" from neighbors such as /v/ and /z/. Error analyses showed that in spelling words such as "ship" and "teeth" in Grade 1, these ESL learners made significantly more predictable L1-specific phonological errors than their classmates who were English speaking children. Over time, as their English proficiency improved, the frequency of such L1-specific errors gradually diminished, and by the end of Grade 2 the spellings of the normally achieving Chinese–ESL children on these items resembled that of their English-as-L1 counterparts.

Rapid automatized naming. Very little research is available on the role played by rapid naming in L2. One exception is a longitudinal study by Geva (2000a) which focused on bilingual English-Hebrew children. Whether tested in English or Hebrew, phonological processing tasks and rapid naming of objects, letters, or colors, were significant predictors of word recognition and pseudoword reading in Grade 1 in both languages. Phonological processing continued to play a significant role in predicting basic reading skills in English in Grade 2. However, by Grade 2 rapid automatized naming continued to be a significant predictor of Hebrew (the L2) reading, but phonological processing skills ceased to be significant in predicting accurate reading in Hebrew.

Wimmer et al.'s (in press) study also provides tangential evidence for orthography-specific processes concerning the role of rapid naming. They report that when German children had to read foreign (i.e., English) words, both a phonological awareness deficit and naming-speed deficit predicted difficulties in accurate reading. However, when the same children had to read German words, deficits in phonological awareness did not predict reading accuracy or reading fluency, while naming-speed predicted reading fluency (but not reading accuracy). Wimmer et al. suggest the one difference between the German-based findings and English-based findings has to do with the developmental locus of the impairments. In children learning to read English, the negative effect of a phonological awareness deficit occurs early and affects the acquisition of phonological coding in word reading, and further slows down the "build-up of the orthographic lexicon." In the case of regular orthographies such as German, the early acquisition of phonological coding in word reading develops more smoothly. In these languages the negative effects of factors which underlie the early phonological awareness deficit and the early naming-speed deficit occur later, when reading fluency and orthographic spelling become important.

Morphosyntactic processing. Evidence for cross-orthography differences that may influence the ease with which spelling develops comes from a recent study by Cormier and Landry (2000) of French immersion children in grades 1–3. French is a more opaque language with regard to the morphology of the plural form than English. In English, with a few exceptions, plurals are represented as either *-s* or *-es*, and are always articulated. In French there are three forms *-s*, *-x*, and *-aux* for marking the plural of nouns. The French *-s* and *-x* are unarticulated, as is the *-x* in *aux*. The researchers studied the development of sensitivity to markers of plural morphology in English-speaking children's spelling in French immersion classes in Canada. Their results confirm the observation that phonological mechanisms are at work when children begin to learn to read and write in L1 or L2 involving alphabetic codes. Moreover, they found that children in French immersion programs have difficulties in spelling the silent morphemes marking plurality in French, whereas spelling of voiced or regular marking is more accurate. They also found that auditory analysis shared a substantial amount of variance with spelling, whereas syntactic awareness was only related to the spelling of plural morphemes in English. In a second study, French-speaking children also performed poorly on spelling the irregular *-aux*. In other words, difficulty with *-aux* is common to children learning to spell in French, whether it is their L1 or their L2. Specific phonological and orthographic characteristics of French plural morphemes hinder the development of accurate spelling of plural forms in French, regardless of whether it is children's L1 or L2, and there is an advantage to learning to spell articulated morphemes over unarticulated morphemes.

Conclusion

Languages vary in the sub-lexical linguistic units which are salient when children learn to read. In some languages the syllable is a salient unit whereas in other languages sub-syllabic units such as onsets and rimes, consonant clusters, and morphosyntactic elements such as plural markers are salient. At the same time, some languages are associated with orthographies that are transparent and easy to decode. Other languages are associated with more opaque or "deep" orthographies. When children learn to read, characteristics of the spoken language interact with characteristics of the orthography. One of the conclusions one can draw from this review is that phonological awareness plays a significant role in the acquisition of word recognition skills in different alphabetic and nonalphabetic languages. When elements in the spoken language map easily onto the writing system, the learning curve may be steeper than when the spoken language does not map easily, onto the orthography. In other words, the impact of phonological awareness may prevail longer in less transparent orthographies than in shallow orthographies.

Cross-orthography and cross-linguistic interest in the role of rapid naming has emerged only recently. This cognitive-linguistic process exerts its role regardless of differences in linguistic or orthographic complexity and often appears to coexist with phonological awareness. Moreover, a review of research available to date suggests that rapid naming is a significant predictor in learning to read in different L1s as well as when children learn to read in L2. However, it appears to play a more dominant role relative to phonological awareness in studies involving transparent orthographies than it does in studies involving opaque orthographies.

Prior research on reading development in bilingual children has indicated that individual differences in L1 and L2 basic reading skills can be partially accounted for by individual differences in phonological processing skills, verbal memory, and rapid naming, and that these skills transfer from L1 to L2 and from L2 to L1. The present review suggests that (a) these linguistic and cognitive measures can predict the development of reading skills in L1 and L2 children in various languages; and (b) individual differences in such prerequisite skills can be indicative of smooth or problematic acquisition of ESL reading skills, regardless of oral language proficiency.

However, task demands associated with learning to read in different orthographies vary and yield steeper or more moderate learning slopes. Differences related to orthography-specific characteristics may hinder or facilitate the development of specific skills. Children may even read more accurately in their L2 than their L1 when the L2 is associated with a shallow orthography. Similarly, it seems that underlying prerequisite skills such as phonological awareness may be more transient when normally achieving children begin to learn to read in a transparent orthography than when they learn to read in a more opaque writing system such as English. Moreover, specific linguistic elements may challenge the novice learning to read in an L1 or L2. Yet caution should be exercised in attributing persistent difficulties in learning to decode and spell to difficulties with isolated and demanding linguistic elements. Regardless of the language and orthography combinations studied, children develop reading strategies that help them to read.

Notes

1. The scope of this review does not allow us to address other aspects of word recognition such as orthographic knowledge, lexicality, and visual processes. For recent research evidence on lexicality effect in Chinese children see Shu, Anderson, and Wu (2000).

2. With regard to Chinese the debate currently concerns the extent to which visual processes involved in character recognition are mediated via verbal processes (see, for example, Hu & Catta, 1998; Huang & Hanley, 1994; McBride-Chang & Ho, 2000).

3. Recent adult-based studies also show that phonological processing takes place in Chinese word recognition (Perfetti & Tan, 1998; Perfetti & Zhang, 1991, 1995; Perfetti, Zhang, & Berent, 1992; Tan, Hoosain, & Siok, 1996; Weeks, Chen, & Lin, 1998; see Tan & Perfetti, 1998; for a review).

4. Relatedly, Shimron and Sivan (1994) have shown that the resources required to "unpack" inflected words in Hebrew text exert a powerful influence on the reading of Hebrew by adult native speakers.

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This article reports on a 2-year longitudinal study that investigated the development of basic reading skills in two cohorts of grade 1 English-as-a-second-language and English-as-a-first-language primary level children. Contrary to what might be expected, measures of vocabulary knowledge in English and nonverbal intelligence were not significant predictors of word recognition in either language group. However, individual differences in phonological awareness and in rapid naming of letters, both measured in English, explained substantial amounts of variance in word recognition performance at intervals of 6 months and 1 year later in both groups. Results indicate that, in spite of the absence of fully developed proficiency in the L2, it is feasible to use these measures as reliable indicators of normal and problematic development of basic reading skills for children learning to read in the L2.

Goswami, U., Gombert, J., & Barrera, L. (1998). Children's orthographic representations and linguistic transparency: Nonsense word reading in English, French, and Spanish. *Applied Psycholinguistics, 19,* 19–52.

These researchers used pseudowords that share orthographic and phonological features with real words at the level of the rime (e.g., *cake-dake*), that shared only phonological features (e.g., *cake-dake*), or pseudowords whose rime units could not be read on the basis of analogies with real words at the phonological or orthographic level (e.g., *faish, ricop*). Children learning to read French or English were more accurate and faster when they read items such as *dake* or *daik*, where they could rely on familiarity with phonological and/or orthographic units, then when they had to read pseudowords such as *ricop*, where they could not rely on large-unit analogies with real words.

Ho, C. S.-H., & Bryant, P. (1997c). Phonological skills are important in learning to read Chinese. *Developmental Psychology, 33,* 946–951.

This study found that phonological skills assessed in young prereaders significantly predicted children's reading performance in Chinese two and three years later, even after controlling for effects of age, IQ, and mother's education. The authors suggest that the main reason for this relationship is that phonological knowledge helps children to use the phonetic components in Chinese characters.

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RESEARCH METHODS

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12. PSYCHOLINGUISTICALLY ORIENTED SECOND LANGUAGE RESEARCH

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This chapter reviews recent research that investigates second language performance from the perspective of sentence processing (on-line comprehension studies) and word recognition. It concentrates on describing methods that employ reaction time measures as correlates of processing difficulty or knowledge representation. This research suggests that second language learners employ much the same on-line processing strategies as native speakers, but that the L1 can also influence L2 processing. Reaction times in lexical decision experiments have been useful in exploring the relationship between the first and second language lexicons and automatic processes in lexical access. Finally, the chapter mentions some of the problems in this line of research, in particular the issue of individual differences in working memory and technological challenges.

In principle, most second language experimental research based on theories of grammar and development can be described as 'psycholinguistic' because it seeks to test psychologically plausible models of knowledge of language against performance data from groups or individuals. However, this chapter will limit itself to research that uses reaction time data in an experimental approach. The primary assumption underlying the instruments used is that differences in reaction time to various linguistic tasks are an indirect reflection of mental processes. It is assumed that faster or slower reading times at crucial points in a sentence, or in reaction to words presented in isolation, can provide an insight into difficulties in second language sentence processing and the functioning of language processes in the mind in general.

It is actually slightly embarrassing for the SLA research community that reaction time data have been used in psychometric experiments for nearly a century in order to gain insight into mental abilities and mental processes (Gregory, 1996), whereas in mainstream second language acquisition syntax research, reaction time measures have been used only in the past dozen years or so. Of course, part of the reason for this lies in the history of SLA research and its origins in more pedagogical concerns. This overview will therefore present the principal uses of reaction times in second language research and describe some of the main procedures. The goal is to focus on method rather than results, since far too many questions remain unanswered for any sound conclusions to be drawn at this early stage. I do not revisit controversial issues on the epistemology of second language knowledge, which have been raised in previous articles (Segalowitz & Lightbown, 1999). The fact is that formal linguistics plays a key role in investigating knowledge of a second language, regardless of the outcome of the debate over the access to Universal Grammar.

Reaction Times to Whole Sentences

Grammaticality judgments (GJ) have been used in second language acquisition research to gain an insight into the learner's linguistic competence (White, 1989); the assumption is that if learners' knowledge of what is possible and not possible in the second language matches that of native speakers, they may be claimed to have a competence which is based on similar mental constructs. However, GJ tasks have been criticized on a number of grounds (e.g., Birdsong, 1989; Gass, this volume; Schütze, 1996). Specifically, grammaticality judgments may elicit data that are inconclusive with regard to precisely why a learner either rejected or accepted a sentence. In addition, learners may bring irrelevant metalinguistic knowledge to bear on subtle linguistic knowledge that is the focus of a study. In order to mitigate these limitations, researchers have sought to complement GJ data with other measures.

Reaction time data have been used as one such supplementary measure (Bley-Vroman & Masterson, 1989; Cook, 1990; White & Genesee, 1996; White & Juffs, 1998). It is assumed that ungrammatical sentences may take longer to judge because there is no structural description in the learner's grammar which matches that ungrammatical sentence: as a result, the parser may attempt a number of different analyses before giving up and assigning an ungrammatical status to it. This process will take longer than one in which a grammatical sentence can be quickly identified as such. One example of a study that used reaction time data in addition to GJ judgments is White and Juffs (1998). The study involved Chinese-speaking learners of English L2. The target structures involved grammatical and ungrammatical *wh-* questions: two examples of such questions are given in (1). In (1a) a subject is extracted from an embedded clause, whereas in (1b) an object is extracted. (The original location of the fronted *wh-* phrase is marked with a 't' in these examples).

1. a. *Who* does John know *t* saw Mary?
   b. *Who* does John know Bill saw *t*?

Participants in this study read whole sentences on a computer and decided whether these sentences were grammatical or not. The time that the learners took to make their judgments was also recorded. Results showed learners were less accurate at accepting *wh-* extractions from the subject position of an embedded clause and that they also took longer to judge such sentences than object extractions. White and Juffs argue that the increased time the learners took to judge the subject extractions supports earlier claims by Schachter and Yip (1990) that subject extractions are more difficult to process than object extractions. They further suggest that it is this processing difficulty that underlies the lower accuracy on sentences like (1a) and not a problem with the underlying grammar of the learners. The problem with reaction times for whole sentences is that this technique does not allow one to hone in on precisely where in the sentence the processing difficulty is. This issue was taken up in Juffs and Harrington (1995) and will be discussed in the context of the methodology described in the next section.

Another example of the use of reaction times is the Sentence Matching Paradigm (Crain & Fodor, 1987; Freedman & Forster, 1985). This technique has been used in second language acquisition research by Clahsen & Hong (1995), Duffield and White (1999), Eubank (1993), and Eubank, Bischof, Huffstutler, Leek, and Nest (1997), among others (see Klein, 1998, pp. 202–204 for a review). Let us consider Duffield and White's (1999) study as an example. Duffield and White investigated the knowledge of clitic pronoun placement in Spanish L2 by English-speaking and French-speaking learners. In Spanish, clitics can be in a variety of positions, some of which are illustrated in (2a) - (2c); while clitic placement in Spanish is variable, clitics cannot appear in the positions in (3). Hence, learners must learn some constraints on clitic placement that may not be apparent from simple generalizations from the input.

2. a. Juan la encuentra complemente estúpida.
Juan her finds completely stupid
'John finds her completely stupid.'

b. Marta quiere comprarlas con cheque
Martha want to buy-them with check
'Martha wants to buy them with a check.'

c. Marta las quiere comprar con cheque
Martha them want to buy with check
'Martha wants to buy them with a check.'

3. a. * Juan encuentra la complemente estúpida.
Juan finds her completely stupid
'John finds her completely stupid.'

b. * Marta quiere las comprar con cheque
Martha want them to buy with check
‘Martha wants to buy them with a check.’

In the sentence-matching paradigm, two sentences at a time are presented on a computer screen: some pairs are grammatical, with both members having the same structure, whereas some pairs have one grammatical and one ungrammatical member. The task for the participants is to say whether the sentences are the ‘same’ or not. Pairs that are grammatical, ‘the same,’ usually take a shorter time to judge than the pairs that consist of a grammatical and an ungrammatical sentence. If these differences in latencies are reliable, researchers infer that learners show a sensitivity to ungrammaticality, and therefore to constraints. In this way, methods from psycholinguistics can tap competence—indirectly, as all other measures do—without actually asking for a judgment that may reflect a range of factors which have no bearing on competence. The Duffield and White study is particularly interesting because the results from their reaction times are confirmed by their paper and pencil judgment task. This is a reassuring result since much of our knowledge about L2 syntactic representation relies on the results of GJ tasks. One issue with this research approach is that it may not be appropriate for certain sentence types, in particular subjacency violations (Crain & Fodor, 1987).

Reaction Times Word by Word During Processing of a Whole Sentence

In addition to recording the time it takes for a participant to read a whole sentence, or a pair of sentences, researchers are interested in how learners process data in the second language *word by word*, since an understanding of processing *breakdown* may be a key to understanding how processing takes place under normal circumstances. It is also generally believed that processing breakdown may provide insights into the causes of change in underlying competence (Fodor, 1998; Klein, 1998; White, 1987). Detailed knowledge of processing in a second language is similarly important for understanding second language development. It is especially important to understand processing for classroom L2 development in view of current claims concerning the importance of ‘input processing’ as an instructional technique (e.g., VanPatten, 1996).

A vast literature on first language sentence processing exists, and space does not permit a thorough review here (for recent collections of papers see Fodor & Ferreira 1998, and Vincenzi & Lombardo, 2000). Briefly, psycholinguists believe that the human sentence processor (parser) does not wait for a whole string of words and then try to assign a structure to that string in one analysis; rather, the parser begins immediately building clause structure which is based to a large extent on the syntactic requirements of predicates. Hence, if the parser encounters a transitive verb, it will expect an object NP, but not if the verb is intransitive. As the structure is built, it is reanalyzed as necessary to incorporate new information, which may tell the parser that the first analysis was not the correct one. Debate in mainstream psycholinguistics has centered on the timing of the integration of pragmatic information during the course of parsing: some researchers believe that pragmatic information is immediately available for use by the parser, whereas others favor a view in which pragmatics is only used when the syntactic parser has made its first analysis. In addition, researchers are divided about the effects of the frequency of a particular structure in the input on the probability that the parser will construct a particular clause type (e.g., Bever, 1992).

Although it is possible to investigate syntactic processing off-line (e.g., Ying, 1996), investigations that seek to examine word by word processing use the technique called the 'moving window' or 'self-paced' reading technique. In the 'moving window' (Just, Carpenter, & Woolley, 1982), data are collected using a procedure on a personal computer. Each sentence is presented in random order on a computer screen, one word at a time. The words appear in linear position in the sentence moving across the screen from left to right (i.e., the words are usually not centered on the screen). Presentation may be centered between the top and the bottom of the screen. The presentation of each word is controlled by the participant, who presses a key to continue reading. (Hence the reading speed is determined by the participant and not the experimenter.) As each successive word in the sentence is prompted, the previous word disappears. Thus, only one word appears on the screen at a time as the sentence is read. After the last word of the sentence is read, the participant presses a key to provide a response either to a grammaticality judgment or to a comprehension question. It is customary to run analyses on reaction times for correct responses only.

Researchers who have investigated word-by-word processing in second language acquisition include Hoover and Dwivedi (1998), who investigated the processing of clitics in L2; French, Juffs, & Harrington (1995, 1996), who investigated *wh-* processing; and Juffs (1998a, b), who investigated issues of argument structure and ambiguity resolution. Juffs and Harrington (1995) used the moving window technique to confirm the claim made by White and Juffs (1998) that it was the subject gap in sentences like (1a) that was the source of difficulty. It is also possible to look for insights into second language reading with this technique and to consider issues in mainstream psycholinguistics in an L2 context. For example, Juffs (1998a) explored L2 knowledge of main verb vs. reduced relative clause ambiguity in English L2 by Japanese, Chinese, and Romance speaking learners. Main verb versus reduced relative clause ambiguity can cause conscious reanalysis problems. These problems have been dubbed the so-called Garden Path effect because readers and hearers are misled as to the structure of a sentence and they have to backtrack in order to achieve the correct analysis. The most famous example of this is Bever's (1970) sentence in (4), (¿ = Garden Path sentence), which causes reanalysis problems when the verb 'fell' is encountered. Readers have great difficulty in understanding this sentence because reanalyzing 'raced' as a reduced relative is difficult—if 'raced' remains the main verb, 'fell' will have no subject and the sentence will not make sense.

4. ¿The horse raced past the barn fell.

Although extensive research had been carried out on such structures since Bever's original work, MacDonald (1994) was interested in the fact that sentences like (5) pose no processing problems at all, even though such sentences have exactly the same structure as sentences like (4) at the point where the *first* verb, 'interviewed,' is encountered.

5. The homeless people interviewed in the documentary were calm, articulate and intelligent by any standard.

There is clearly something about the sentence in (5), unavailable in (4), which makes the parser able to recover from an initial misparse. MacDonald suggests that two kinds of information in particular are relevant: first, the transitivity properties of 'raced' vs. 'interviewed': 'race' can be either a transitive or an intransitive verb, whereas 'interview' can only be transitive; second, the material immediately following the verb 'interviewed' in (5), the prepositional phrase 'in the documentary,' signals that an object is almost certainly not present. This is because NP objects must normally be adjacent to their verbs in English. Given this cue and the argument structure of the verb, the parser is left with only one possibility for the interpretation of 'interviewed': a reduced relative. In (4), however, two possible interpretations for 'raced' remain: the intransitive and the reduced relative readings. It is this ambiguity that causes the difficulty in sentences such as (4) according to MacDonald.

Juffs (1998a) researched this issue with second language learners. Like MacDonald (1994), he looked at 6 different sentence types, given in (6). There are three kinds of reduced relative: in (6a–b) the reduced relative is *unambiguous* because of the morphology of the verb — it is clearly a past participle. In (6c–d), the verb is like 'interviewed' in (5); it can only be transitive. In (6e–f), the verb may be either transitive or intransitive, as in 'raced' in (4).

6. a. The bad boys /seen during the morning/ were playing/ in the park.
b. The bad boys /seen almost every day/ were playing/ in the park.
c. The bad boys /criticized during the morning/ were playing/ in the park.
d. The bad boys /criticized almost every day/ were playing/ in the park.
e. The bad boys /watched during the morning/ were playing/ in the park.
f. The bad boys /watched almost every day/ were playing/ in the park.

After each verb is a cue to the correct analysis: 'during the morning' is a good cue because it is a preposition and cannot be the beginning of an object NP; it helps the parser realize that the verb is not a main verb. In contrast, 'almost every day' is a bad cue because 'almost every' could be the beginning of an object NP; it continues to allow the parser to maintain the main verb analysis. A good cue will force the parser to abandon a misparse early and thereby make errors easier to recover from. The prediction is that (6a) should be easiest to process, whereas (6f) should pose the most problems. The moving window procedure permits on-line observation of how the second language reader processes the differences in transitivity of verbs, how sensitive they are to morphology, and whether different cues are as useful to second language readers as they are to native speakers. The level of difficulty is assessed by recording and comparing the reading time on the second verb phrase in slashes 'were playing.' Learners should take more time to read that portion of (6a) than (6f).

The results of the Juffs study revealed that, like native speakers, the advanced L2 participants in his study build structure incrementally and revise it as they progress. (In contrast, in a study that did not use RT data, Fernandez [1998] claims that processing by Spanish-speaking learners of English L2 shows clear differences between the way natives and non-natives attach adjunct phrases.) Juffs' study also showed that the Chinese were the least sensitive to the cue provided by an irregular past participle and that all learners showed some sensitivity to the transitivity and strength cues provided. These results are important because they show on-line that some learners may need additional training in *noticing* bottom up processes such as morphology. This research can be seen as complementary to the reading research done with eye-tracking technology, for example that reported by Bernhardt (1991) and Frenck-Mestre and Pyntte (1997). Indeed, these research tools deserve more attention from researchers interested in understanding the reading process.

Lexical Decision Tasks in Lexical Processing, Vocabulary Assessment, and Word Recognition

The third area in which reaction times are used is in the area of lexical processing and word recognition (e.g., de Bot, Cox, Ralston, Schaufeli, & Weltens, 1995; van Hell & De Groot, 1998; van Heuen, Dijkstra, & Grainger, 1998; Segalowitz, Segalowitz, & Wood, 1998; Segalowitz, Watson, & Segalowitz, 1995). These are very important areas of research which syntacticians interested in second language development have not been drawn to. Indeed, there is a curious lack of dialog between researchers interested in syntactic development and those interested in lexical representation and learning. This lack of communication is odd because most current theories of syntax, e.g., Minimalism (Chomsky, 1995) and Head-driven Phrase Structure Grammar (Sag & Wasow, 1999), insist on the importance of lexical information in determining clause structure. The research on lexical representation therefore has a great deal to offer syntax-based researchers. We will start with a study that addresses the knowledge structures in the bilingual lexicon with data from reaction times.

In research discussed by de Bot, Cox, Ralston, Schaufeli, and Weltens (1995), lexical decision tasks are used to gain an insight into the nature of the bilingual lexicon. The questions addressed in this research are familiar ones: are the lexicons of the bilingual interdependent or independent? The structure of the lexicon that de Bot is working with has three levels: a conceptual level, which is the real-word referent; a 'lemma' level that includes morphological and syntactic requirements; and the lexeme level which is more restricted to the phonological form of the word. Relationships among words in one language, and among words from different languages that a bilingual speaks, may exist at every one of these three levels, only a subset, or none. The program of research is to determine these relationships.

Once again, reaction times are key in determining the inferences researchers make about knowledge representation: in de Bot et al.'s study, which looks at Dutch-English bilinguals, participants are primed with a word that may be a cognate in English-Dutch, but may range from being phonologically identical (e.g., *nest* - *nest*), to phonologically similar (e.g., *double* - *dubbel*), to merely being translation equivalents (e.g., *tree* - *boom*). Participants are presented with a 'prime' on the computer (in this case through ear-phones); a second word is then presented, and the participant has to decide whether it is related to the first one; the time taken to decide is recorded. Researchers use the latencies to infer relationships among deeper meaning representations and/or phonological representations. Latencies for words that are related in some way to the 'prime' are generally shorter than for those trials in which the prime and the second word are unrelated. Hence, if an L1 word 'primes' a related L2 word faster than another unrelated L1 word, we can infer a relationship between these two words from different languages in the mental lexicon. From the results of their own and other studies, de Bot et al. suggest that visual and phonological processing are in fact different. In particular, they find robust effects for semantic links in their auditory study that had not been found in earlier work.

The results of such research have the potential to inform both word-by-word reading time research described above and other reading research. Researchers interested in isolating syntactic processes from other factors will have to control lexical items carefully. If cognates give learners from closely related languages an advantage at the lexical access level of the lexeme (phonological encoding) when processing syntax, any increased facility in syntactic processing may be due to faster lexical access and not superior ability to deploy syntactic resources on-line. On the other hand, if no advantage is available and only conceptual priming is helpful, close lexical choices need not be avoided. Moreover, de Bot points out that as of the mid 1990s, little is understood concerning the level of the lemma and how such knowledge can be related from L1 to L2. Relating research from the word-by-word reading paradigm (e.g., Juffs, 1998b) to lexical access should result in a better understanding of crosslinguistic influence at the lemma level. This is because lemma-level influence can be observed when parsing since different languages encode the syntactic requirements of verbs in slightly different ways; for this reason, lemma-level influence is deployed when incremental building of structure occurs and can be observed in the moving window paradigm.

A study presented in Segalowitz, Watson, and Segalowitz (1995) also relied on timed lexical decision tasks, but in this case with a different goal. The assumption was that faster lexical access would enable learners to process text better; the corollary was that more rapid local lexical processing should correlate with higher general reading ability. The methods involved recording reaction times from an individual learner across a span of three weeks in order to track the process of making word recognition faster through study of words that were individually meaningful to the participant. In addition, reaction times to high and low frequency words were investigated in order to determine whether a higher frequency in the input would lead to a more rapid and hence more automatic recognition. Segalowitz and his colleagues reached the tentative conclusion that the study of words makes access faster and that therefore reading comprehension might be enhanced. In their study, reaction times were used to infer processes and changes in automaticity of lexical access, rather than the nature of knowledge representation. Nevertheless, the results make clear that investigations of knowledge representation must control for word frequency when using reaction times to make claims about such representation. While this may slow down the research at the preparation stage, the results of studies that control for frequency will be much more convincing.

Problems with Use of Reaction Time Data

The main intervening variable that arises when using reaction time data to try to get an indirect view of second language competence and second language processing is individual differences in working memory. Individual variation in working memory has already been suggested as a variable that can be used to explain variation in second language development (e.g., Ellis & Sinclair, 1996; Harrington & Sawyer, 1992, Miyake & Friedman, 1998). It is certainly well known that individual differences in working memory among native speakers can affect comprehension (e.g., MacDonald, Just, & Carpenter, 1994). Hence, future research will not only have to take into account processing differences based on frequency of words and clause types in the input, differences in proficiency level among participants, and crosslinguistic differences in lemma structure, but also in individual differences in working memory. Such a complicated array of factors ensures that the psycholinguistic study of L2 knowledge representation and access will be very complex indeed; in fact, any model that does NOT incorporate components that allow for variation along these lines will have to be considered incomplete.

A practical issue needs to be raised in any review of this literature. The computer software that is used (e.g., MicroExperimental Laboratory, or MEL; Schneider, 1990) is sometimes difficult to program without significant technical help. Second language researchers who use these techniques need to properly prepare themselves. In addition, testing of subjects is usually done on an individual basis and is very time and cost intensive. These considerations make the whole enterprise expensive. However, the technology available is advancing: PsyScope and MEL have joined forces so that software will be available on both Mac and PC platforms. (See the new E-prime web site for details:

http://www.pstnet.com/e-prime/e-prime.htm, or for Macintosh, see: http://psyscope.psy.cmu.edu/).

Finally, difficulties may be encountered by researchers in the statistical analysis. These issues need to receive careful attention from trained statisticians. One remaining gray area is the important issue of what to do with data for sentences for which an incorrect grammaticality judgment is made or to which an incorrect response is provided in a comprehension task (Duffield & White, 1999; Juffs & Harrington, 1996; MacDonald, 1994). In L1 experiments, error data tend to be quite limited and so their exclusion can be more easily defended, but in L2 studies error data can be as high as 33%. Such large amounts of error data pose serious questions about conclusions that are drawn based on the remaining data.

Conclusion

Psycholinguistically oriented L2 research has a long tradition as far as studies of the bilingual lexicon are concerned, but syntacticians have only recently adopted research tools long used in mainstream psycholinguistics. As a result, they have much ground to make up, both in terms of research design and statististical sophistication. To some extent, researchers with training in psychology and those with training in linguistics are also working with different assumptions and models (see Segalowitz, this volume). This research is increasing in volume, but only slowly, in part because of the technical problems discussed above. However, as Klein (1998, p. 210) points out, many of these studies must be replicated before firm conclusions can be drawn. In future, the field can move forward by integrating psychological methods with linguistic perspectives; such research will afford a much richer, and hence, more accurate, picture of the complex mental representation(s) possessed by a speaker of more than one language and will permit a better understanding of how such representations develop.

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One theoretical article every second language researcher interested in parsing and acquisition should read is this recent one by Fodor. From it, researchers will gain a clear understanding of the importance of the parser in first language development. Fodor concentrates on the issues of how a learner can select a grammar from the input. She brings the failure of the early Principles and Parameters view of acquisition—'flipping switches'

—to the attention of both first and second language researchers. She suggests that parameter setting can be saved by proposing that parameters are in fact 'pieces' of trees (treelets) that a learner uses to parse the input and determine whether the treelet is the appropriate one for the ambient language.

de Groot, A. M. B., & Kroll, J. F. (Eds). (1997). *Tutorials in bilingualism: Psycholinguistic perspectives*. Mahwah, NJ: Lawrence Erlbaum Associates.

This is an important edited volume that contains papers relevant to the kind of research program carried out by de Bot et al. (1995), but also a wide range of other authors including well-known figures in SLA: for example, Harley and Wang discuss critical period issues, Ellis and Laporte have a paper on implicit and explicit learning; N. Segalowitz contributes a paper on ultimate attainment. In addition, the volume contains a paper by Cook to give the whole volume a real cross-section of the kind of research discussed in this review.

Healy, A., & Bourne, L. (Ed.). (1998). *Foreign language learning: Psycholinguistic studies on training and retention*. Mahwah, NJ: Lawrence Erlbaum Associates.

This important volume has a variety of new research papers. The first section is more linguistic and has chapters on a range of topics from the effect of first language phonological configuration on lexical acquisition in a second language to mediated processes in foreign language vocabulary acquisition and retention. The second section is more applied, but includes chapters on cognitive strategies in discourse processing. The third section contains classroom research on the enhancement of text comprehension through highlighting and the effect of alphabet and fluency on reading. The final section discusses cognitive aspects of bilingualism, including working memory.

Nicol, J. L. (Eds.) (2000). *One mind, two languages: Bilingual language processing*. Malden, MA: Blackwell.

There are no monograph length works written by second language syntacticians that incorporate reaction time methodology into their work. However, this recent edited volume by Nicol is by a researcher who has a strong reputation in L1 psycholinguistics and research methods. The volume focuses on how bilinguals represent and process language. It contains chapters on methodological issues in bilingual research, new empirical research, and summaries of past work.

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13. INNOVATIONS IN SECOND LANGUAGE RESEARCH METHODS

Susan M. Gass

Acceptance of the claims made by researchers in any field depends in large part on the appropriateness of the methods used to gather data. In this chapter I focus on two approaches to research in second language acquisition: (a) various types of acceptability judgments or probes aimed at assessing acquisition of syntactic structure; and (b) various types of stimulated recall designed to gather learners' accounts of their own thought processes. Both methods attempt to overcome a principal problem in psycholinguistics: the desire to describe a learner's knowledge about a language based on the incomplete evidence stemming from learner production. Refinements in acceptability judgments have come from some newer multiple-choice or truth-value story tasks that allow researchers to determine the level of learner knowledge about particular syntactic structures (in the examples here, reflexives). Stimulated recall offers some additional perspectives, but its usefulness can be greatly affected by the temporal proximity of the recall to the original task; the amount of support provided to prompt the recall; and the nature and amount of training given to both interviewer and interviewee. While these newer research methods can improve the accuracy and variety of data available to SLA investigators, research methods drawn from L1 acquisition or L1 research cannot necessarily be assumed to be equally valid when used to examine L2 acquisition.

The topic of research methods is a vexed one. Gathering data is often limited only by one's imagination, yet, at the same time, the method itself must be valid and reliable. Thus, one is faced with a constant dilemma of how to elicit data using methods that are sufficiently understood, and hence, have face validity, while avoiding data that, because of the methodology used, are ambiguous in their interpretation. In fact, consensus about the validity of any field of research is dependent on an understanding of the methods used to gather data. As a reflection of the uncertainty of what methods in second language acquisition (SLA) and applied linguistics research stand for, one needs only think about the number of books and articles reflecting this topic (cf., Davis & Lazaraton, 1995; Gass & Mackey, 2000; Han, 2000; Markee, 2000; Schachter & Gass, 1996; Tarone, Gass, & Cohen, 1994; Yule, 1997).

As a way of illustrating the complexity of issues that come with newer methodologies, in this chapter I focus on two distinct areas of second language research, one dealing with the acquisition of a particular syntactic structure (reflexives) and the other dealing with a methodology that is being used of late to illustrate thought processes of second language learners. The field of SLA is multidisciplinary. In its history as well as in its present form it is influenced by numerous source fields. This has led to many discussions of methodology inasmuch as each source discipline brings with it its own favored research traditions and prejudices (both positive and negative) about the validity and insufficiency of certain methods.

As an example, consider linguistically-based SLA research. Most research within linguistics has traditionally been conducted using a form of acceptability judgment.[1] This was clearly the case when SLA research had its beginnings in the 1960s and is also the case, although clearly to a lesser extent, in today's research climate (see Juffs, this volume). From the early years of SLA research, it became apparent that without an examination of what information acceptability judgments were tapping, one could not accept their use unquestionably. This was clearly recognized when, even while using acceptability judgments as a means of gathering data, researchers often felt the need to justify their use. In addition, over the years, their validity and reliability have been called into question using empirical data as opposed to theoretical argumentation alone as evidence (Cowan & Hatasa, 1994; Ellis, 1990; 1991; Goss, Ying-Hua, & Lantolf, 1994). Even those who believe that acceptability judgments are a valid and reliable means of collecting data (e.g., Gass, 1994), recognize the difficulties involved.[2]

Some of the early debates about methods in second language research centered precisely on this form of data elicitation. Selinker (1972, p. 213) ignited the debate when he stated that researchers should "focus ... analytical attention upon the only observable data to which we can relate theoretical predictions: the utterances which are produced when the learner attempts to say sentences of a TL." This view, which clearly denounces acceptability judgments as well as any sort of introspection as a viable data source, given that judgments are not "produced utterances," had supporters and detractors. Corder (1973), for example, pointed out that spontaneously produced utterances provide only a part of the picture. If one wants to obtain information about the knowledge that learners have, then one must also have a means to determine which sentences they think are possible in a second language (i.e., grammatical) and which they believe are not possible in a second language (i.e., ungrammatical). To accomplish this, some means other than what learners produce is necessary (see additional discussion in Gass, 1997).

Once acceptability judgments were no longer used as the quintessential data-elicitation method for obtaining information about second language learners' knowledge of the L2, other sources of data became more prominent, each with differential claims of validity and reliability (e.g., elicited imitation, Bley-Vroman & Chaudron, 1994; Munnich, Flynn, & Martohardjono, 1994; magnitude estimation, Bard, Robertson, & Sorace, 1996; sentence matching, Gass, in press; Plough & Gass, 1999; Gass, in press). These and other newer methods have gained credence over the years although none is without problems.

The Evolution of Methods in Investigating Reflexives

The preceding discussion has focused primarily on one method of second language data elicitation that has engendered controversy since the 1960s. We turn now to a discussion of one particular grammatical structure and focus on the methodological issues surrounding an understanding of how that structure is acquired by second language learners. This discussion is intended to demonstrate the evolution of methodology, as one data-elicitation method superceded another in order to hone in on a way of gathering data that appropriately reflected learners' knowledge of a second language. The controversy elucidates the validity problems discussed earlier.

The issue at hand is the acquisition of reflexives. The particular issue concerns sentences such as the following:

1. Sally told Jane to wash herself.

The question relates to the referent of *herself*. In English the interpretation of *herself* is limited to Jane. In other languages, however, this sentence may be ambiguous. The acquisition question is: How do learners learn to restrict or expand the interpretation of reflexives when their native language differs from the target language? Complexities involve the number of clauses in a sentence (monoclausal vs. biclausal sentences) and, in biclausal sentences, whether the embedded clause is finite or nonfinite. Sentence (1) illustrates a monoclausal sentence and sentences (2) and (3) illustrate biclausal sentences (finite and nonfinite).

2. Biclausal, finite embedded clause (from Glew, 1998)
Tom noticed that Bill was looking at himself in the mirror.

3. Biclausal, nonfinite embedded clause (from Glew, 1998)
Tom told Bill to trust himself more.

The answer to the acquisition question is highly dependent on methodology. For example, one early study (Finer & Broselow, 1986) used a picture-identification task whereby learners were given a sentence containing a reflexive and were shown two pictures. The task (see also Eckman, 1994) involved selecting a picture that accurately reflected the meaning of the sentence. Lakshmanan and Teranishi (1994) pointed out that the picture-identification task itself may be questionable because a learner may be able to select the correct picture based on nongrammatical knowledge, and hence, the results may not be valid at all. Others (e.g., Hirakawa, 1990; Thomas, 1989) used a multiple-choice test as a means of elicitation. For example, learners were given a sentence such as the one given in (1) and were asked whom *herself* could refer to. Choices, such as those in (4) were offered.

4. (a) Sally
   (b) Jane
   (c) Either Sally or Jane
   (d) Someone else
   (e) Don't know

Lakshmanan and Teranishi (1994) noted that this method for gathering information about learners' knowledge of reflexives is flawed because it provides information only about what *can* be a possible antecedent of *herself*, but not about what *cannot* be a possible antecedent. Glew (1998) similarly noted that in doing either a picture-identification task or a multiple-choice task, a learner may have a strong preference for a sentence. In such cases, that individual may select only one of the choices and not consider all the possibilities of interpretation. Thus, one is left not knowing what a nonresponse means. Does it mean that the learner did not consider all possibilities or that she or he did consider all possibilities and that the sentences that were not selected are ungrammatical for that learner? White, Bruhn-Garavito, Kawasaki, Pater, and Prévost (1997, p. 143) pointed out that "the fact that they [learners] choose only one interpretation does not necessarily mean that the other is excluded from their grammar." It is essential to recognize that both grammatical and ungrammatical information are necessary to completely understand what an individual knows about a second language. As Glew (1998) pointed out, traditional methods tap preferences rather than complete intuitions.

Another difficulty in dealing with reflexives has to do with interpretation based on contextual or pragmatic information. A sentence such as (5) generally elicits a response such that the typical interpretation from studies of native and nonnative speakers of English is that *actor* is the antecedent of *himself* (White et al., 1997).

5. The actor gave the man a picture of himself.

This is so for grammatical and pragmatic reasons (actors are more likely to distribute pictures of themselves rather than distribute pictures of others).

However, a reading whereby the second NP is the antecedent is also possible. For example, consider the following situation: A man had had a lot of pictures taken of himself. An actor found one of these pictures and "The actor gave the man a picture of himself." As noted above, there is a difference between preferences and what is allowed and disallowed. Sentence (5) in its most typical preferred reading yields *the actor* as the antecedent of *himself.* However, that does not tap the full range of possibilities because, given a different context, as mentioned above, *the man* is also possible. In other words, a learner may select *actor* because that is the obvious and most usual reading, while not considering other possibilities.

White et al. (1997) used a truth-value storytelling task to elicit data. The context consisted of a short description of a context, followed by a sentence. Participants were asked to state whether the sentence accurately described the context. An example from White et al. (p. 153) is given in (6).

6. Susan wanted a job in a hospital. A nurse interviewed Susan for the job. The nurse asked Susan about her experience, her education and whether she got on well with people.
The nurse asked Susan about herself. True/False

With a variety of contextual clues, one can distinguish between preferences and intuitions. White et al. also gave a picture-identification task to their same group of learners. In this task, the participants read a sentence and then had to state whether that sentence did or did not match a picture. In comparing the results from the two tasks, they found that the story task was better at showing the allowability of objects as antecedents as in (6) above, where *Susan* is the antecedent of *herself.* However, to further show the complexity of adopting any method, they noted that when participants did a picture-identification task, they apparently first read the sentence and then looked at the picture. Their first impression may have blocked future interpretations, much as the first viewing of an optical illusion may preclude us from seeing other interpretations of a figure.

Truth-value story tasks provide a way of manipulating context to demonstrate the effect of pragmatics on judgments of acceptability. For example, the sentence in (7) below (Glew, 1998), would lead one to an ungrammatical conclusion (in English) that *himself* referred to *doctor.* The story (and common sense) tells us otherwise. If a learner selects "True" (assuming an understanding of the story), one can assume that a learner allows reflexives to be coreferential with the subject of the matrix sentence; if a learner, on the other hand, selects "False," the learner understands that *himself* refers to doctor and this is false, given the context. Thus, through this method, one can determine the limits of ungrammaticality for learners.

7. John was sick in the hospital. He was nervous because he needed an operation. A doctor came into John's hospital room and said, "Hello John, I am the doctor. I will operate on you tomorrow."
John heard that the doctor will operate on himself. True/False

In yet another variation of data elicitation, Lakshmanan and Teranishi (1994) presented the target sentence with all of the nonpossibilities for the reflexive antecedent. An example appears in (8).

8. John said that Bill saw himself in the mirror.
    a. 'Himself' cannot be John. agree disagree
    b. 'Himself' cannot be Bill. agree disagree

In this way, all of the possible responses can be ascertained.

The preceding discussion has illustrated the evolving sophistication of and concern with research methodology in order to establish the validity of the methodology itself and ensure that the data elicited reflect what researchers believe they reflect. In the next section, I deal with stimulated recall, a form of introspection.

Stimulated Recall

The goal of SLA research is to determine what second language learners know about a second language (i.e., what sorts of grammars are formed and are not formed), when they come to know it, and how they come to know it. Because traditional methodologies have been in debate due particularly to their face validity, new methods have come into greater use and greater acceptance. One that has received attention of late is recall methodology, particularly stimulated recall methodology.

SLA research, like all psycholinguistic research, is faced with the inevitable problem of needing to determine the processes involved in learning, yet not being able to observe those processes. All that is observable is what a learner produces, in writing or in speech or in response to specific researcher probing. Researchers in second language acquisition have over the years developed greater sophistication in the techniques used for probing, with the goal of determining underlying linguistic knowledge and/or linguistic processing. Many are borrowed and/or adapted from other fields.

Various methods have been used to determine underlying linguistic knowledge, including having learners introspect about their knowledge. Like all methodological tools, introspection (acceptability judgments being one type) has not been without its detractors, but it is now being used once again with some frequency and with increased confidence. In this section I consider the broader area of verbal reporting with a particular focus on stimulated recall.

As mentioned above, introspection, of which stimulated recall is one part, has not always been accepted as a valid tool for gathering information about knowledge of language (first or second)[3] (see also Smagorinsky, this volume). In fact, during the behaviorist era, valid data were those that were *produced*; verbal reporting, a form of introspection, was not an "allowable" source of information (see Gass & Mackey, 2000 for an extensive discussion of the history of introspection).

In general, verbal reporting is a data-gathering method whereby individuals are given a task (e.g., writing a composition or solving a problem) and asked to say what is going through their minds as they are working their way through the task. Clearly, it is not possible for there to be simultaneous verbalization at all times. This is particularly the case when reflection concerns an oral interaction. In those instances, verbal protocols are collected after the event. There are numerous ways in which this can be done and numerous factors that must be considered in determining the validity of the verbalized thoughts as an accurate reflection of the actual thoughts at the time of the event.

When dealing with stimulated recall, the verbalization is done with some support. The support may be in the form of a written piece that the learner has produced or a video or audio of some event (e.g., an oral interview or, in the case of second language interaction research, a task involving an oral interaction). An important aspect of stimulated recall is the temporal relationship of the recall to the original event. Recall can be consecutive (immediately following a language event, see Mackey, Gass, & McDonough, 2000), delayed (perhaps a day or so after the event) or nonrecent (e.g., research in which one reflects over a period of time about learning strategies). Bloom (1954) found decreasing accuracy as a function of the time interval between the recall (whether stimulated or not) and the event being recalled. In other words, with greater time delays, it is not clear what can be claimed with regard to the memories that are being accessed.

There are numerous ways that stimulated recall can fail, some of which have been mentioned above. In general, not only does one have to set up an appropriate structure (e.g., time interval, strong support stimulus), but one also has to adequately train the participants (both interviewer and interviewee) in the art of verbalization; furthermore, one has to avoid the common pitfall of asking the wrong question during a recall procedure. In particular, it is often difficult to separate a reflection relating to the moment of recall from a reflection about a previous event. For example, consider the following exchange between a researcher and a second language learner. The learner had participated in a "Spot the Difference" task in which an interviewer had frequently stopped her to seek clarification. Following the initial episode, which had been videotaped, the researcher replayed the tape, asking the learner what was going through her mind at the moment of the original episode (from Gass & Mackey, 2000, p. 91). The first three columns reflect the original episode and the second two are the comments from the stimulated recall episode.

NNS Original Comments	NS-1 Feedback	NNS Response	NS-2 Stimulated Recall Prompts	NNS Response
He just look at-look at me				
	He's what			
		Look at me		
	He's looking at you?			
		Yeah		
			Why was she saying that?	
				It's a um, I cannot cannot cannot answer clearly
			What do you mean clearly?	
				I have to answer, I have to answer correct because the word is so weird
			You are saying the word is weird?	

In this instance, the interviewer did not focus on the event, but rather focused on the moment of the interview (which immediately followed the event). She used the present tense when she said "What do you mean clearly?" and later "You are saying the word is weird?" It was not made clear by the interviewer that the learner (interviewee) was supposed to be recalling what she was thinking at the time of the event itself. Results such as these are, of course, suspect.[4]

In sum, stimulated recall methodology is a relative newcomer to the data-collection repertoire of second language research. It provides a window onto the thought processes of learning, but must be used with care if the results are to be valid.

Conclusion and a Cautionary Note

Innovation in research methods comes with a price tag attached. Many researchers have become dissatisfied with traditional SLA methods and have turned to methods that have been used in other fields. These tend to come more from psycholinguistics than from linguistics. Among them are reaction time experiments and sentence matching. But, even though the methods are widely accepted in other fields, they must be tested in the SLA arena. For example, sentence matching tasks have been used recently in SLA studies, yet an examination of their validity shows them not to give the same information for nonnative speakers as they do for native speakers (Gass, in press; Plough & Gass, 1999). Thus, innovation must be careful and deliberate. One cannot necessarily come to the same conclusions about nonnative speaker knowledge as one can about native speaker knowledge. Methods do not always transfer.

Notes

1. We differentiate between acceptability judgments and grammaticality judgments even though the latter term is commonly used for both. Technically, when one conducts research, one asks someone if a particular sentence is acceptable. From this we infer whether the given sentence is grammatical (that is, whether it can be generated by the grammar).

2. A difficulty in using acceptability judgments with second language learners as opposed to native speakers of a language has to do with the type of knowledge that second language learners have. When dealing with second language data as opposed to native speaker data, learners do not have total control over the area of grammar that they are being asked about. When a native speaker of English is asked if the sentence *That's the woman I talked about her* is a possible sentence or not, we can safely assume that a negative response means that the sentence is not part of the grammar of English. But, when we ask a second language learner about the same sentence, it is not clear what to make of a negative response. Does the negative response arise because the sentence is truly ungrammatical in this individual's second language grammar or did the learner have no idea and guessed? The latter reflects indeterminate knowledge—knowledge over which there is no information on which to base a judgment.

3. Second language is to be interpreted broadly and refers to any language learning after the first (i.e., second, third, fourth, and so forth).

4. These data were originally collected for a study dealing with interactional feedback (Mackey, Gass, & McDonough, 2000). Because of the problems inherent in this interview, these data were eliminated from the final database.

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14. RETHINKING PROTOCOL ANALYSIS FROM A CULTURAL PERSPECTIVE

Peter Smagorinsky

Some form of verbal report—that is, a research participant's concurrent or retrospective verbal account of thought processes during problem-solving activities—has been used throughout this century as the data base from which psychologists have developed theories of human mentation. Newell and Simon (1972) and Ericsson and Simon (1980, 1993) have provided extensive justification for use of one such method, *protocol analysis*, to investigate cognition from an information processing (IP) perspective. They have characterized protocol analysis as a methodology capable of providing evidence of the cognitive processes used when people attend to information stored in short term memory (STM) in order to solve problems. Cultural-historical activity theory (CHAT), with its concern for the mediation of human development by culturally- and historically-grounded signs and tools based on the work of Vygotsky (1987), Leont'ev (1981), and others, suggests a different view of protocol analysis. In this chapter I outline a CHAT perspective that accounts for protocol analysis along three key dimensions: (a) the relationship between thinking and speech from a representational standpoint; (b) the social role of speech in research methodology; and (c) the influence of speech on thinking during data collection. The purpose of this discussion is to illustrate how use of verbal reports can be viewed through a CHAT lens and to identify alternative assumptions necessary to use it from a CHAT perspective.

When I was a graduate student in the 1980s, I undertook the study of writing processes that follow from different approaches to composition instruction (see Smagorinsky, 1989a, 1989b, 1991, 1992, 1994). The method of choice for studying thought processes at the time was *protocol analysis*. My work, like virtually all use of protocol analysis at the time, was grounded in information processing (IP) theory, particularly as outlined in Ericsson and Simon's (1978, 1979, 1980, 1984/1993) extensive justification of using verbal reports to study cognitive processes. Throughout their work, they provide a detailed and empirically-supported rationale for using both concurrent and retrospective protocols to build models of cognition, addressing and refuting challenges to both IP and protocol analysis that came from a variety of perspectives. Their account of protocol analysis provided the foundation for a whole field of study and established information processing as an important theoretical perspective for understanding how people think as they work.

Along with many others in the field of literacy studies, I experienced a shift during the 1990s from an emphasis on what happens within the head to an effort to understand the role of context in cognitive processes. The work of cultural psychologists and linguists such as Cole (see Newman, Griffin, & Cole, 1989), Hymes (1974), Moll (1990), Rogoff (1991), Wertsch (1985, 1991), and other modern interpreters of Vygotsky (1978, 1987) caused me to reconsider some aspects of information processing theory. In effect, these cultural psychologists shifted attention from internal cognitive processes to what IP theorists call the *task environment* of cognition and its influence on how cognitive frameworks develop. Using a framework variously known as cultural-historical, sociocultural, or sociocognitive, these theorists' view of the task environment was fundamentally historical, seeking to understand how cultures develop value-laden social practices, artifacts, and institutions that provide frameworks for thinking. The study of cognition, from this perspective, cannot be isolated from its social and cultural relationships. Rather, cognitive processes are viewed as a consequence of cultural practices which therefore vary according to the values and activities of different cultural groups. From this perspective, cognition is not something that is strictly internal, to be studied by efforts to disinter its functions from the confines of the skull.

I thus was faced with a dilemma. I continued to respect and draw on the work of IP theorists, including a number who used protocol analysis to study writing (e.g., Bracewell & Breuleux, 1994; Flower & Hayes, 1984) and reading (e.g., Pressley & Afflerbach, 1995). I felt that protocol analysis was well-justified within an IP perspective, particularly by Newell and Simon (1972) and Ericsson and Simon (1984/1993), and that it was a powerful tool for studying the kinds of composing processes I was interested in—not only those involved in writing (e.g., Smagorinsky, 1997), but those involved in artistic composing (see Smagorinsky & Coppock, 1994, 1995a, 1995b).

At the same time, I began to question a set of foundational assumptions made by IP theorists about the nature of speech and the nature of cognition. In my own work, I began to wonder if what I was studying was cognition as an isolated phenomenon, or cognition as socially-mediated by cultural tools, particularly speech. That is, I began to wonder if the participants, in rendering either a retrospective or concurrent protocol, were giving evidence of inner processes, as assumed by IP theory, or whether they were saying things to me that might be different from what they'd say to someone else. I began to think about my own implication in the emergence of data, causing me to question whether I was studying cognition or interaction. Through my reflection on a series of studies conducted using some kind of protocol to study composing through either art or writing, I began to question and retheorize my assumptions about what happens during the collection and analysis of a verbal protocol. Ultimately, the question that I asked was: What do we study when we study what people say?

In this chapter I will give a brief account of some conclusions I have come to in response to this question. My views have not been received positively by key IP theorists; indeed, my original articulation of these issues (Smagorinsky, 1998) was met with a stern rebuke from Ericsson and Simon (1998). My goal with this rumination has never been to discredit their work, which I still consider to be a model of how to build a theory through empirical study. Rather, my goal is to consider how protocol analysis (or any other method of eliciting verbal data, including interviews, retrospective accounts, etc.) functions from a cultural perspective. The areas I wish to reconsider are (a) the relationship between thinking and speech from a representational standpoint; (b) the social role of speech in research methodology; and (c) the influence of speech on thinking during data collection.

What Words Represent

A major assumption of IP theory is that the words uttered in a protocol serve as evidence from which to build models of cognition that in turn predict the unfolding of the verbal reports (Ericsson & Simon, 1980, 1993). The IP characterization of protocol analysis as a verbal *report* suggests that what is verbalized is a reasonably accurate account of something interior. Thinking aloud, argue Ericsson & Simon, "will not change the structure and course of the task processes, although it may slightly decrease the speed of task performance" (1980, p. 226).

From a cultural perspective a verbal protocol represents the speaker's cultural conception of the word, which may or may not match the researcher's interpretation of the protocol content. In Vygotsky's (1987) view, the study of speech is the study of cultural history. Human consciousness is not the isolated functioning of a single mind. Rather, the mind is social; that is, the organization and process of thinking is a consequence of the ways in which a person has learned to use cultural tools, particularly speech. Words are both immediately social and historically cultural, says Vygotsky: "In consciousness, the word is what—in Feuerbach's words—is absolutely impossible for one person but possible for two. The word is the most direct manifestation of the historical nature of human consciousness" (p. 285).

The two people described by Vygotsky do not live in isolation, but are products of culture. We can extrapolate, then, to say that the word is possible only because of the ways in which one's predecessors have used it. Historical uses of words, then, provide the context for the development of concepts by individual members of a culture. These concepts provide the groundwork for how to think and act in the world.

For individuals as well as cultures, word meaning reveals the conceptions that guide action. To Vygotsky (1987), words reveal the whole state of human consciousness. Word meaning is the appropriate unit of analysis for studying cognitive development because through the meanings that people attribute to words, psychologists can understand the degrees of abstraction that they have achieved in their thinking. Researchers, then, need to view artifacts, including words, as representative of cultural history and of the mediational means through which world views are represented and internalized.

Furthermore, words are fundamentally *communicative*, providing a meaning potential that is then interpreted by others according to their own culturally-learned conceptions. Understanding a protocol, then, involves understanding the web of meanings within which it is voiced and understanding the larger social goals that motivate its use. With the variance of cultural-historical traditions across both societies and idiocultures, any understanding of a verbal protocol must come through an understanding of the local social practices that mediate its production.

To achieve this understanding one needs to identify and account for the environmentally-channeled task and trajectory of an action. This premise implies that interpreting a protocol requires knowledge of the participant's cultural history, the researcher's goal-directed behavior within the conduct of the study, and the degree to which their congruence allows for words to be understood in the same way by both researcher and participant. Toward this end, Vygotsky (1987) viewed training sessions as among the most critical areas of study, for that is where researchers can "study how the subject uses the sign as a means of directing his intellectual operations. Depending on how the word is used, depending on its functional application, we are able to study how the process of concept formation proceeds and develops" (p. 128). The training period, then, is not practice, but rather provides an understanding of the participant's developing understanding of the researcher's expectations for the task.

Conducting a conventional protocol collection and analysis can thus run the risk of assuming that the researcher's understanding of words is the true understanding, and that the participant's role is to gravitate toward the researcher's conceptions. A cultural psychologist might ask a different set of questions, centering on the participant's conception of the task and how the person's prior cultural experiences have mediated that conception. A cultural psychologist would be less interested in building a cognitive model, and more interested in understanding how a participant would come to attribute particular meanings and conceptions to words. In doing so, the goal would not be to build a general cognitive model. Instead, the goal would be to understand the particularity of someone's conceptions and the cultural practices through which they have developed.

The Social Role of Speech in Research

The factor of cultural mediation has immediate as well as historical implications for conducting protocol analysis. Researchers have long been concerned with the issue of *reactivity*, which is the way in which a method of investigation affects the phenomena being studied (see Rosenthal, 1966). Researchers, for instance, can help shape results by anticipating preferred outcomes and subtly providing conditions that favor their development. IP researchers recognize these interaction effects and try to neutralize them through controlling both the content of the instructions to participants, which does not cue specific thoughts or actions, and the physical presence of the researcher, who is positioned behind the participant (see Ericsson & Simon, 1993).

I would argue that it is possible to change but not reduce social factors in protocol-based research. Social factors are part of any environment, even when other people are not present, due to the artifactual nature of social settings. My view is based on my understanding of Bakhtin (1981, 1984, 1986), particularly as his work has been presented by Cole (1996), Holquist (1981), and Wertsch (1985, 1991). Bakhtin proposed the concept of *dialogism* to describe the way in which word meaning is fundamentally historical and cultural. All speech has a social basis and is uttered as part of an ongoing, linked set of utterances. Speech is thus inevitably conversational in a sense, deriving from prior utterance and contributing to what follows.

Bakhtin's (1986) notion of dialogism leads him to argue that "*addressivity*, the quality of turning to someone, is a constitutive feature of the utterance; without it the utterance does not and cannot exist. The various typical forms this addressivity assumes and the various concepts of the addressee are constitutive, definitive features of various speech genres" (p. 99; emphasis added). The addressee need not be immediately present but might be distant, and might further be an indefinite other rather than a specific person. Wertsch (1991) points out that:

> Ultimately, an utterance reflects not only the voice producing it but also the voices to which it is addressed. In the formulation of an utterance a voice responds in some way to previous utterances and anticipates the responses of other, succeeding ones; when it is understood, an utterance comes into contact with the "counter word" of those who hear it. Bakhtin's concern with addressivity in the utterance thus involves both a concern with *who is doing the speaking*—the fact that "the utterance has ... an author" (1986, p. 95)—and a concern with *who is being addressed*. Because any utterance entails the idea of addressivity, utterances are inherently associated with at least two voices (p. 53, emphasis in original).

Bakhtin (1984) additionally argues that, because utterance is inherently social, speech can be part of "hidden dialogicality" (p. 197) in which the speaker anticipates a listener, even if that listener is not physically present.

The notions of addressivity and hidden dialogicality suggest that the speech elicited by a protocol can be viewed as a conversational turn. My reading of Bakhtin came serendipitously during my study of the writing of a high school senior named Doug (see Smagorinsky, 1997). The protocol collection was different from that of most studies in that Doug was issued a portable cassette recorder that he kept for four months, providing protocols *in situ*. Doug's situated use of the protocol brought out its social nature and hidden dialogicality. Although he and I rarely had personal contact, he frequently addressed me as he talked into his tape recorder while writing or thinking about his writing. At one point, for instance, he said,

> I would like to take the chance to thank you for letting me do this because it is kind of neat to get my thoughts out. ... It is kind of neat to have someone to talk to like this. And after I am done with the experiment, I will keep doing this, I will keep talking in the recorder. Leave some sort of physical memory behind of me, but other than that it helps to get my voice out. It is something that I can't always talk about to other people (p. 92).

His transcript included a number of occasions where he made comments to me in this way, illustrating the communicative role that the protocol played in his reflection on his writing.

That think-aloud protocols can potentially be influenced by the characteristics of a researcher is not a new observation. Rosenthal (1966) catalogued the seemingly endless number of interpersonal effects between researcher and participant that can affect the emergence of data, including effects based on gender, race, perceived ethnicity, researcher biases and hypotheses, and other factors. As noted, IP researchers try to neutralize these factors. From a Vygotskian perspective, it is impossible to neutralize the social context; rather, researchers can only ignore it.

Using protocol analysis from a cultural perspective, then, would require trying to understand the utterance in terms of its conversational nature. Doing so would involve an effort to understand which conversations the participant has engaged in prior to the protocol and how those conversations contribute to the kind of utterance produced in the protocol setting. Perhaps more critically, the analysis would attempt to understand the conversational partner envisioned by the participant and how the conception of that partner constrains and enables the participant to say particular things. Doug, for instance, told me in a subsequent interview that he said things during his protocol that were very personal, things he'd never say to his parents or to other teenaged boys. He viewed me as somewhat of a confessor, a "third party" listener with whom he could share his thoughts. The content of his protocol, then, was a direct function of whom he believed himself to be addressing.

The Mediation of Thinking by Speech

From an IP perspective the goal of protocol research is to use verbal reports to generate models of cognitive processes. If IP researchers are to achieve this goal, they must regard mediating influences as potential sources of contamination of the processes they are trying to infer and thus try to minimize interference and influence during data collection. These mediators include such material things as researchers and their prompts, which the researcher tries to contain through careful, theoretically-informed data collection procedures. The speech of the protocol is not viewed as having mediational potential, but rather is regarded as a representation of inner cognitive functions (also see Juffs and Gass chapters, this volume).

The goal of research from a Vygotskian perspective is quite different: to understand development as it is culturally mediated. If cultural psychologists are to achieve this goal, they must identify and understand the ways in which artifacts mediate cognitive change (Cole, 1996). Speech is the central cultural tool that serves this mediating function. The mediated nature of consciousness is an assumption from which a cultural psychologist's work proceeds. The goal, then, is to understand the ways in which the tool of speech mediates the thinking that is studied through the collection of a protocol, and the ways in which uses of speech are mediated by other cultural means. Speech, then, is viewed in fundamentally different ways by cultural and IP researchers.

This view of speech emerges from what Wertsch (1985) identifies as the three bases for taking a Vygotskian perspective: a reliance on a genetic (i.e., developmental) method, the belief that higher mental processes are social in origin, and the claim that mental processes are mediated by tools and signs. The assumption behind this view is that psychological tools such as speech provide the means through which individuals internalize the higher mental processes central to social transactions within particular cultures. Furthermore, they provide the means through which they act on their environments. These tools not only mediate the development of higher mental processes, *they are themselves a fundamental part of those processes*. The mind, in this conception, "extends beyond the skin" (Wertsch, 1991, p. 14); that is, the mind is socially distributed and inextricably linked to the tools of mediation (Salomon, 1993). Thus the changes in consciousness that are usually the objects of psychological study are inseparable from the goal-directed, tool-mediated action through which the changes take place (Smagorinsky, 1995; Wertsch, 1985, 1991). To Vygotsky (1987), "thinking depends on speech, on the *means of thinking*, and on the child's sociocultural experience. ... the development of the child's thinking depends on his mastery of the social means of thinking, that is, on his mastery of speech" (p. 120).

Protocols, therefore, cannot be, to use a common metaphor, windows that allow researchers to peer into workings of the mind. Rather, they are part of the mediational process itself, and thus contribute to the process of articulation that produces the thinking that the protocols are designed to study.

Vygotsky (1987) describes the process through which inner speech is transformed to public speech:

> Thought is not only mediated externally by signs. It is mediated internally by meanings. The crux of the matter is that the immediate communication of consciousness is impossible not only physically but psychologically. The communication of consciousness can be accomplished only indirectly, through a mediated path. This path consists in the internal mediation of thought first by meanings and then by words. Therefore, *thought is never the direct equivalent of word meanings. Meaning mediates thought in its path to verbal expression.* The path from thought to word is indirect and internally mediated. (p. 282; emphasis added)

He argues that *thinking achieves meaning on its way to articulation*:

> Even at the outset, then, thought and word are not cut from a single mold. In a certain sense, one can say that we find more opposition than agreement between them. The structure of speech is not a simple mirror image of the structure of thought. It cannot, therefore, be placed on thought like clothes off a rack. Speech does not merely serve as the expression of developed thought. Thought is restructured as it is transformed into speech. It is not expressed but completed in the word. Therefore, precisely because of their contrasting directions of movement, the development of the internal and external aspects of speech form a true unity. (p. 251)

Through this process of articulation, inner speech is restructured, transformed from "a predicative, idiomatic speech into the syntax of a differentiated speech which is comprehensible to others" (p. 280). In Vygotsky's view *"What is contained simultaneously in thought unfolds sequentially in speech.* Thought can be compared to a hovering cloud which gushes a shower of words" (p. 281; emphasis in original). Thinking only makes social sense after being transformed to the cultural artifact of the word, a process that reciprocally helps to produce the thoughts.

If a researcher adopts this assumption, collecting and analyzing protocols becomes highly problematic. If thinking becomes rearticulated through the process of speech, then the protocol is not simply representative of meaning. It is, rather, *an agent in the production of meaning*. What researchers study, to use Vygotsky's (1987) metaphor, is the shower of words and not the storm cloud of thought.

While one generates the other, they are not the same. Both are dynamic, and both are continually in a process of "unfolding" (Vygotsky, 1987, p. 280).

The problem is much more complex when analyzing thinking and speech. Clouds, while having a history and existing within a context, do not have a consciousness or live within a culture; they have no memory, no volition, no tools, no motive. The problems of analyzing the artifact of speech, under the assumption that there is a dialectic relationship between thinking and speech, are virtually limitless given the range of variables potentially available to confound any interpretation.

Yet, from the perspective of cultural psychology, protocols can still be useful research tools. I think, however, that they would be used in service of different questions. In particular, the mediating role of speech itself could become an object of study. My studies of artistic composing, for instance, have consistently shown that when students interpret literature through drawing, dance, music, and drama, their processes of text production serve not only to represent their understanding of the literature, but to change their thinking about the literature's meaning. In open-ended tasks such as this, protocol analysis could be used as a way to understand how the process of utterance mediates thinking. Viewed in this way, protocols ought not be controlled to reduce variables, but should be understood in terms of all of the variables that come into play. These include the transformational potential that Vygotsky and his adherents would argue is central to the act of speaking or engaging in other tool-mediated action.

Conclusion

My effort to reconceive protocol analysis from a cultural perspective suggests that a protocol should be analyzed as a situated practice with antecedent cultural history. From a practical standpoint, this task is somewhat outlandish. There is, after all, a lot of history, and it would not be possible to say with certainty which historical actions are relevant to the study of a particular protocol. History can only be partially reconstructed, and so the cultural precedents for a protocol could only be sampled and inferred. A second, related problem concerns the perspective adopted to tell that history, which is inevitably subjective, biased, and selective, and thus open to fitting with the agendas of the researcher. Protocol analysis, then, is a research tool that must be employed with some care and theoretical consideration for what in fact is being studied.

My purpose here has been to outline what a method intimately connected to one research paradigm might look like when used from the perspective of another. My primary argument is that when tools cross paradigmatic boundaries, their use and potential must be reconceived in terms of different sets of research questions and qualifications. I see my effort not as a call to abandon information processing theory, but as an attempt to borrow one of its tools and use it quite differently. Viewed this way, protocol analysis can serve the interests of cultural psychologists effectively and help make distinctive contributions to the understanding of human cognition.

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Michael Cole is among the key American thinkers in the Vygotskian tradition. Following the receipt of his doctorate, he studied with Vygotsky's student Luria in Moscow, after which he served as co-editor of *Mind in Society*, a collection of Vygotsky's major essays. In *Cultural Psychology: A Once and Future Discipline,* Cole outlines Cultural-Historical Activity Theory (CHAT), a strand of Vygotskian psychology generally attributed to Leont'ev. To do so Cole draws on his 30 years of studying the relationship between culture and psychology in diverse societies and settings to argue that engagement in cultural practice is the primary determinant of what we understand to be the human mind.

Ericsson, K. A., & Simon, H. A. (1993). *Protocol analysis: Verbal reports as data*, 2nd edition. Cambridge, MA: MIT Press.

Ericsson and Simon are the primary architects of the research method *protocol analysis*. *Protocol Analysis: Verbal Reports as Data* is the most astute and comprehensive rationale for using protocol analysis to study human cognition from an information processing perspective. The authors detail hundreds of studies from diverse fields that have employed protocol analysis and address criticisms from those who argue against introspective research methods. Their book explains the theoretical underpinnings of information processing theory and how protocol analysis, when conducted according to the principles they outline, yields valid information about cognitive processes and structures.

Vygotsky, L. S. (1987). Thinking and speech. In L. S. Vygotsky, *Collected works* (vol. 1, pp. 39–285) (R. Rieber & A. Carton, Eds; N. Minick, Trans.). New York: Plenum.

Vygotsky's *Myshlenie i Rech': Psikhologicheskie Issledovaniya*, published in 1934 around the time of his death, has been translated three times, the first two as *Thought and Language* and finally as *Thinking and Speech*, a title that more accurately suggests Vygotsky's more dynamic conception of both thinking and its primary mediational tool, speech. Many of Vygotsky's key constructs are outlined here, including his distinction between complexes and concepts, his distinction between spontaneous and scientific concepts, his semiotic view of language as a cultural artifact, his view of speech as a mediational tool, his view of word meaning as the basic unit of analysis for studying human consciousness, and his conception of inner speech as internalized egocentric speech. His view of psychology as a function of cultural practice emerges from these constructs.

Wertsch, J. V. (1991). *Voices of the mind: A sociocultural approach to mediated action*. Cambridge, MA: Harvard University Press.

Wertsch outlines a cultural theory of mind derived from a synthesis of Vygotsky, Bakhtin, others. A key contribution is his introduction of "multivoicedness" of human mind due to social action that engages and internalizes the voices of others that then echo through any new discourses. Wertsch further departs from Vygotsky by arguing that speech is but one of many mediational tools through which people both shape and are shaped by culture. He argues that a larger "tool kit" of mediational means is more theoretically appropriate to account of the diverse ways in which people act cognitively, and appropriate and echo the voices or other cultural means of expression produced by members of social groups.

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